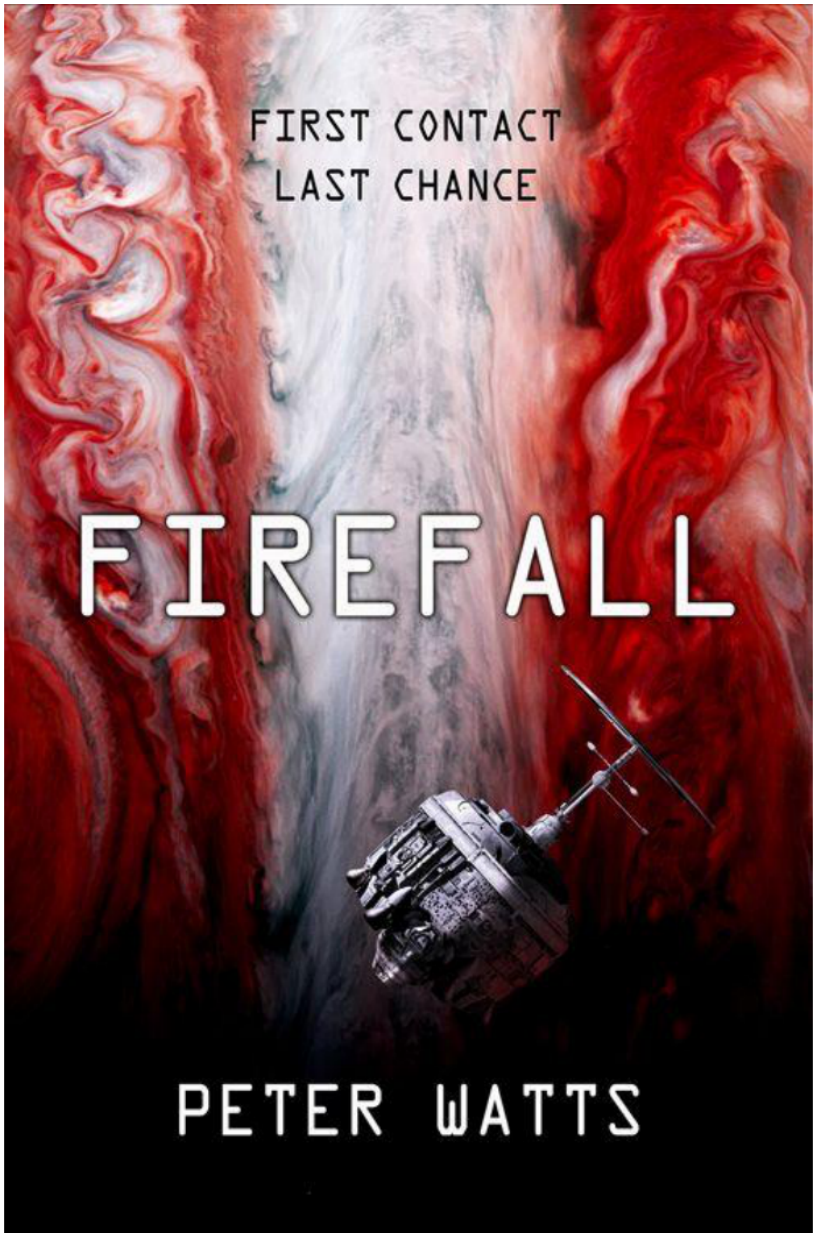


The book cover features a dramatic, swirling background of red, white, and grey, resembling a nebula or a massive fire. In the lower right, a detailed satellite or space station is depicted against the dark void of space. The title 'FIREFALL' is prominently displayed in the center in a large, white, blocky font with a subtle drop shadow. Above it, the tagline 'FIRST CONTACT LAST CHANCE' is written in a smaller, black, monospaced font. At the bottom, the author's name 'PETER WATTS' is printed in a white, blocky font.

FIRST CONTACT
LAST CHANCE

FIREFALL

PETER WATTS

FIREFALL

PETER WATTS

Blindsight

Echopraxia

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A WELCOME AND A WARNING

Actually, this could be a warning or an apology. It really depends on you.

If you're just browsing—flipping through pages, scrolling down screens prior to purchase—I've caught you in time. Be warned that there isn't one book between these covers, but two: *Blindsight* and *Echopraxia*, bundled into an omnibus Collector's Edition to commemorate their first appearance from a UK publisher.

It's actually a nice change to be able to deliver this kind of message. The last time I found myself in this position I was telling people not that their purchase contained two novels, but half of one—and that they'd have to pay the price of a second hardcover if they wanted to see how the story ended. (My US publisher has an unfortunate habit of splitting novels into multiple volumes, dropping each bleeding body part onto an unsuspecting public without telling them it's not a complete product.) This is definitely the better option. Still, *Blindsight* has been out for a while now—it was first released in 2006—so if you've already read it, half this ticket price will be for words you've already seen. You might reasonably bristle at the prospect of having to pay for something you've already read, just to get your hands on something you haven't.

If that's the case, never fear; a standalone edition of *Echopraxia* will be hitting the stands in a few months. Of course, waiting that long means you won't be the first on your block to read it (unless this omnibus tanks, in which case maybe you will), but at least you'll have that much more opportunity to read the reviews and decide if you even want to. The upside of delayed gratification is reduced risk.

So that's the deal, and that's the choice. But only if you haven't bought this yet. If you have—if you're sitting in your favorite reading chair, having just torn open your freshly-

bought copy of this new *Firefall* novel that you'd somehow never heard of until you spied it in the local bookstore, only to realize *Wait a second, I've fucking read this already*—all I can say is, sorry. I tried to warn you. But you do have both novels now, in a spiffy omnibus format for the ages, adorned with cool new art that I myself had a hand in constructing. Those spaceships? I made them myself.

Hopefully that might count for something.

—Peter Watts, July 2014

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BLINDSIGHT

For Lisa

If we're not in pain, we're not alive.

THIS IS WHAT FASCINATES ME MOST IN EXISTENCE: THE
PECULIAR NECESSITY OF IMAGINING WHAT IS, IN FACT,
REAL.

—PHILIP GOUREVITCH

YOU WILL DIE LIKE A DOG FOR NO GOOD REASON.

—ERNEST HEMINGWAY

PROLOGUE

TRY TO TOUCH THE PAST. TRY TO DEAL WITH THE PAST.
IT'S NOT REAL. IT'S JUST A DREAM.

—TED BUNDY

IT DIDN'T START out here. Not with the scramblers or *Rorschach*, not with Big Ben or *Theseus* or the vampires. Most people would say it started with the Fireflies, but they'd be wrong. It *ended* with all those things.

For me, it began with Robert Paglino.

At the age of eight, he was my best and only friend. We were fellow outcasts, bound by complementary misfortune. Mine was developmental. His was genetic: an uncontrolled genotype that left him predisposed to nearsightedness, acne, and (as it later turned out) a susceptibility to narcotics. His parents had never had him optimized. Those few TwenCen relics who still believed in God also held that one shouldn't try to improve upon His handiwork. So although both of us *could* have been repaired, only one of us *had* been.

I arrived at the playground to find Pag the center of attention for some half-dozen kids, those lucky few in front punching him in the head, the others making do with taunts of *mongrel* and *polly* while waiting their turn. I watched him raise his arms, almost hesitantly, to ward off the worst of the blows. I could see into his head better than I could see into my own; he was scared that his attackers might think those hands were coming up to hit *back*, that they'd read it as an act of defiance and hurt him even more. Even then, at the tender age of eight and with half my mind gone, I was becoming a superlative observer.

But I didn't know what to do.

I hadn't seen much of Pag lately. I was pretty sure he'd been avoiding me. Still, when your best friend's in trouble you help

out, right? Even if the odds are impossible—and how many eight-year-olds would go up against six bigger kids for a sandbox buddy?—at least you call for backup. Flag a sentry. *Something*.

I just stood there. I didn't even especially *want* to help him.

That didn't make sense. Even if he hadn't been my best friend, I should at least have empathized. I'd suffered less than Pag in the way of overt violence; my seizures tended to keep the other kids at a distance, scared *them* even as they incapacitated *me*. Still. I was no stranger to the taunts and insults, or the foot that appears from nowhere to trip you up en route from A to B. I knew how that felt.

Or I had, once.

But that part of me had been cut out along with the bad wiring. I was still working up the algorithms to get it back, still learning by observation. Pack animals always tear apart the weaklings in their midst. Every child knows that much instinctively. Maybe I should just let that process unfold, maybe I shouldn't try to mess with nature. Then again, Pag's parents hadn't messed with nature, and look what it got them: a son curled up in the dirt while a bunch of engineered superboys kicked in his ribs.

In the end, propaganda worked where empathy failed. Back then I didn't so much think as observe, didn't deduce so much as *remember*—and what I remembered was a thousand inspirational stories lauding anyone who ever stuck up for the underdog.

So I picked up a rock the size of my fist and hit two of Pag's assailants across the backs of their heads before anyone even knew I was in the game.

A third, turning to face the new threat, took a blow to the face that audibly crunched the bones of his cheek. I remember wondering why I didn't take any satisfaction from that sound, why it meant nothing beyond the fact I had one less opponent to worry about.

The rest of them ran at the sight of blood. One of the braver promised me I was dead, shouted "*Fucking zombie!*" over his

shoulder as he disappeared around the corner.

Three decades it took, to see the irony in that remark.

Two of the enemy twitched at my feet. I kicked one in the head until it stopped moving, turned to the other. Something grabbed my arm and I swung without thinking, without *looking* until Pag yelped and ducked out of reach.

"Oh," I said. "Sorry."

One thing lay motionless. The other moaned and held its head and curled up in a ball.

"Oh *shit*," Pag panted. Blood coursed unheeded from his nose and splattered down his shirt. His cheek was turning blue and yellow. "Oh *shit* oh *shit* oh *shit*..."

I thought of something to say. "You all right?"

"Oh *shit*, you—I mean, you *never*..." He wiped his mouth. Blood smeared the back of his hand. "Oh *man* are we in trouble."

"They started it."

"Yeah, but you—I mean, *look* at them!"

The moaning thing was crawling away on all fours. I wondered how long it would be before it found reinforcements. I wondered if I should kill it before then.

"You'da *never* done that before," Pag said.

Before the operation, he meant.

I actually did feel something then—faint, distant, but unmistakable. I felt angry. "They *started*—"

Pag backed away, eyes wide. "What are you *doing*? Put that *down*!"

I'd raised my fists. I didn't remember doing that. I unclenched them. It took a while. I had to look at my hands very hard for a long, long time.

The rock dropped to the ground, blood-slick and glistening.

"I was trying to help." I didn't understand why he couldn't see that.

"You're, you're not the *same*," Pag said from a safe distance. "You're not even *Siri* any more."

"I am too. Don't be a fuckwad."

"*They cut out your brain!*"

"Only half. For the ep—"

"I *know* for the epilepsy! You think I don't know? But you were *in* that half—or, like, *part* of you was..." He struggled with the words, with the concept behind them. "And now you're *different*. It's like, your mom and dad *murdered* you—"

"My mom and dad," I said, suddenly quiet, "saved my life. I would have *died*."

"I think you *did* die," said my best and only friend. "I think *Siri* died, they scooped him out and threw him away and you're some whole other kid that just, just *grew back* out of what was left. You're not the *same*. Ever since. You're not the *same*."

I still don't know if Pag really knew what he was saying. Maybe his mother had just pulled the plug on whatever game he'd been wired into for the previous eighteen hours, forced him outside for some fresh air. Maybe, after fighting pod people in gamespace, he couldn't help but see them everywhere. Maybe.

But you could make a case for what he said. I do remember Helen telling me (and *telling* me) how difficult it was to adjust. *Like you had a whole new personality*, she said, and why not? There's a reason they call it *radical* hemispherectomy: half the brain thrown out with yesterday's krill, the remaining half press-ganged into double duty. Think of all the rewiring that one lonely hemisphere must have struggled with as it tried to take up the slack. It turned out okay, obviously. The brain's a very flexible piece of meat; it took some doing, but it adapted. *I* adapted. Still. Think of all that must have been squeezed out, deformed, *reshaped* by the time the renovations were through. You could argue that I'm a different person than the one who used to occupy this body.

The grownups showed up eventually, of course. Medicine was bestowed, ambulances called. Parents were outraged, diplomatic volleys exchanged, but it's tough to drum up neighborhood outrage on behalf of your injured baby when playground surveillance from three angles shows the little darling—and five of his buddies—kicking in the ribs of a disabled boy. My mother, for her part, recycled the usual

complaints about problem children and absentee fathers—Dad was off again in some other hemisphere—but the dust settled pretty quickly. Pag and I even stayed friends, after a short hiatus that reminded us both of the limited social prospects open to schoolyard rejects who don't stick together.

So I survived that and a million other childhood experiences. I grew up and I got along. I learned to fit in. I observed, recorded, derived the algorithms and mimicked appropriate behaviors. Not much of it was—heartfelt, I guess the word is. I had friends and enemies, like everyone else. I chose them by running through checklists of behaviors and circumstances compiled from years of observation.

I may have grown up distant but I grew up *objective*, and I have Robert Paglino to thank for that. His seminal observation set everything in motion. It led me into Synthesis, fated me to our disastrous encounter with the Scramblers, spared me the worse fate befalling Earth. Or the better one, I suppose, depending on your point of view. Point of view *matters*: I see that now, blind, talking to myself, trapped in a coffin falling past the edge of the solar system. I see it for the first time since some beaten bloody friend on a childhood battlefield convinced me to throw my own point of view away.

He may have been wrong. *I* may have been. But that, that *distance*—that chronic sense of being an alien among your own kind—it's not entirely a bad thing.

It came in especially handy when the real aliens came calling.

THESEUS

BLOOD MAKES NOISE.

—SUZANNE VEGA

IMAGINE YOU ARE Siri Keeton:

You wake in an agony of resurrection, gasping after a record-shattering bout of sleep apnea spanning one hundred forty days. You can feel your blood, syrupy with dobutamine and leu enkephalin, forcing its way through arteries shriveled by months on standby. The body *inflates* in painful increments: blood vessels dilate; flesh peels apart from flesh; ribs crack in your ears with sudden unaccustomed flexion. Your joints have seized up through disuse. You're a stick-man, frozen in some perverse *rigor vitae*.

You'd scream if you had the breath.

Vampires did this all the time, you remember. It was *normal* for them, it was their own unique take on resource conservation. They could have taught your kind a few things about restraint, if that absurd aversion to right-angles hadn't done them in at the dawn of civilization. Maybe they still can. They're back now, after all— raised from the grave with the voodoo of paleogenetics, stitched together from junk genes and fossil marrow steeped in the blood of sociopaths and high-functioning autistics. One of them commands this very mission. A handful of his genes live on in your own body so it too can rise from the dead, here at the edge of interstellar space. Nobody gets past Jupiter without becoming part vampire.

The pain begins, just slightly, to recede. You fire up your inlays and access your own vitals: it'll be long minutes before your body responds fully to motor commands, hours before it stops hurting. The pain's an unavoidable side effect. That's just

what happens when you splice vampire subroutines into Human code. You asked about painkillers once, but nerve blocks of any kind *compromise metabolic reactivation*. Suck it up, soldier.

You wonder if this was how it felt for Chelsea, before the end. But that evokes a whole other kind of pain, so you block it out and concentrate on the life pushing its way back into your extremities. Suffering in silence, you check the logs for fresh telemetry.

You think: *That can't be right.*

Because if it is, you're in the wrong part of the universe. You're not in the Kuiper Belt where you belong: you're high above the ecliptic and deep into the Oort, the realm of long-period comets that only grace the sun every million years or so. You've gone *interstellar*, which means (you bring up the system clock) you've been undead for eighteen hundred days.

You've overslept by almost five years.

The lid of your coffin slides away. Your own cadaverous body reflects from the mirrored bulkhead opposite, a desiccated lungfish waiting for the rains. Bladders of isotonic saline cling to its limbs like engorged antiparasites, like the opposite of leeches. You remember the needles going in just before you shut down, way back when your veins were more than dry twisted filaments of beef jerky.

Szpendel's reflection stares back from his own pod to your immediate right. His face is as bloodless and skeletal as yours. His wide sunken eyes jiggle in their sockets as he reacquires his own links, sensory interfaces so massive that your own off-the-shelf inlays amount to shadow-puppetry in comparison.

You hear coughing and the rustling of limbs just past line-of-sight, catch glimpses of reflected motion where the others stir at the edge of vision.

"Wha—" Your voice is barely more than a hoarse whisper. "...happ...?"

Szpendel works his jaw. Bone cracks audibly.

"...Sssuckered," he hisses.

You haven't even met the aliens yet, and already they're

running rings around you.

So we dragged ourselves back from the dead: five part-time cadavers, naked, emaciated, barely able to move even in zero gee. We emerged from our coffins like premature moths ripped from their cocoons, still half-grub. We were alone and off course and utterly helpless, and it took a conscious effort to remember: they would never have risked our lives if we hadn't been essential.

"Morning, commissar." Isaac Szpindel reached one trembling, insensate hand for the feedback gloves at the base of his pod. Just past him, Susan James was curled into a loose fetal ball, murmuring to herself. Only Amanda Bates, already dressed and cycling through a sequence of bone-cracking isometrics, possessed anything approaching mobility. Every now and then she tried bouncing a rubber ball off the bulkhead; but not even she was up to catching it on the rebound yet.

The journey had melted us down to a common archetype. James' round cheeks and hips, Szpindel's high forehead and lumpy, lanky chassis—even the enhanced carboplatinum brick shit-house that Bates used for a body—all had shriveled to the same desiccated collection of sticks and bones. Even our hair seemed to have become strangely discolored during the voyage, although I knew that was impossible. More likely it was just filtering the pallor of the skin beneath. Still. The pre-dead James had been dirty blond, Szpindel's hair had been almost dark enough to call *black*—but the stuff floating from their scalps looked the same dull kelpy brown to me now. Bates kept her head shaved, but even her eyebrows weren't as rusty as I remembered them.

We'd revert to our old selves soon enough. Just add water. For now, though, the old slur was freshly relevant: the Undead really did all look the same, if you didn't know how to look.

If you did, of course—if you forgot appearance and watched

for motion, ignored meat and studied *topology*—you'd never mistake one for another. Every facial tic was a data point, every conversational pause spoke volumes more than the words to either side. I could see James' personae shatter and coalesce in the flutter of an eyelash. Szpindel's unspoken distrust of Amanda Bates shouted from the corner of his smile. Every twitch of the phenotype cried aloud to anyone who knew the language.

"Where's—" James croaked, coughed, waved one spindly arm at Sarasti's empty coffin gaping at the end of the row.

Szpindel's lips cracked in a small rictus. "Gone back to Fab, eh? Getting the ship to build some dirt to lie on."

"Probably communing with the Captain." Bates breathed louder than she spoke, a dry rustle from pipes still getting reacquainted with the idea of respiration.

James again: "Could do that up here."

"Could take a dump up here, too," Szpindel rasped. "Some things you do by yourself, eh?"

And some things you kept *to* yourself. Not many baselines felt comfortable locking stares with a vampire—Sarasti, ever courteous, tended to avoid eye contact for exactly that reason—but there were other surfaces to his topology, just as mammalian and just as readable. If he had withdrawn from public view, maybe I was the reason. Maybe he was keeping secrets.

After all, *Theseus* damn well was.

She'd taken us a good fifteen AUs towards our destination before something scared her off course. Then she'd skidded north like a startled cat and started climbing: a wild high three-gee burn off the ecliptic, thirteen hundred tonnes of momentum bucking against Newton's First. She'd emptied her Penn tanks, bled dry her substrate mass, squandered a hundred forty days' of fuel in hours. Then a long cold coast through the abyss, years

of stingy accounting, the thrust of every antiproton weighed against the drag of sieving it from the void. Teleportation isn't magic: the Icarus stream couldn't send us the actual antimatter it made, only the quantum specs. *Theseus* had to filterfeed the raw material from space, one ion at a time. For long dark years she'd made do on pure inertia, hoarding every swallowed atom. Then a flip; ionizing lasers strafing the space ahead; a ramscoop thrown wide in a hard brake. The weight of a trillion trillion protons slowed her down and refilled her gut and flattened us all over again. *Theseus* had burned relentless until almost the moment of our resurrection.

It was easy enough to retrace those steps; our course was there in ConSensus for anyone to see. Exactly why the ship had blazed that trail was another matter. Doubtless it would all come out during the post-rez briefing. We were hardly the first vessel to travel under the cloak of *sealed orders*, and if there'd been a pressing need to know by now we'd have known by now. Still, I wondered who had locked out the Comm logs. Mission Control, maybe. Or Sarasti. Or *Theseus* herself, for that matter. It was easy to forget the Quantical AI at the heart of our ship. It stayed so discreetly in the background, nurtured and carried us and permeated our existence like an unobtrusive God; but like God, it never took your calls.

Sarasti was the official intermediary. When the ship did speak, it spoke to him— and Sarasti called it *Captain*.

So did we all.

He'd given us four hours to come back. It took more than three just to get me out of the crypt. By then my brain was at least firing on most of its synapses, although my body—still sucking fluids like a thirsty sponge— continued to ache with every movement. I swapped out drained electrolyte bags for fresh ones and headed aft.

Fifteen minutes to spin-up. Fifty to the post-resurrection

briefing. Just enough time for those who preferred gravity-bound sleep to haul their personal effects into the drum and stake out their allotted 4.4 square meters of floor space.

Gravity—or any centripetal facsimile thereof—did not appeal to me. I set up my own tent in zero-gee and as far to stern as possible, nuzzling the forward wall of the starboard shuttle tube. The tent inflated like an abscess on *Theseus'* spine, a little climate-controlled bubble of atmosphere in the dark cavernous vacuum beneath the ship's carapace. My own effects were minimal; it took all of thirty seconds to stick them to the wall, and another thirty to program the tent's environment.

Afterwards I went for a hike. After five years, I needed the exercise.

Stern was closest, so I started there: at the shielding that separated payload from propulsion. A single sealed hatch blistered the aft bulkhead dead center. Behind it, a service tunnel wormed back through machinery best left untouched by human hands. The fat superconducting torus of the ramscoop ring; the antennae fan behind it, unwound now into an indestructible soap-bubble big enough to shroud a city, its face turned sunward to catch the faint quantum sparkle of the Icarus antimatter stream. More shielding behind that; then the telematter reactor, where raw hydrogen and refined information conjured fire three hundred times hotter than the sun's. I knew the incantations, of course—antimatter cracking and deconstruction, the teleportation of quantum serial numbers—but it was still magic to me, how we'd come so far so fast. It would have been magic to anyone.

Except Sarasti, maybe.

Around me, the same magic worked at cooler temperatures and to less volatile ends: a small riot of chutes and dispensers crowded the bulkhead on all sides. A few of those openings would choke on my fist: one or two could swallow me whole. *Theseus'* fabrication plant could build everything from cutlery to cockpits. Give it a big enough matter stockpile and it could have even been built another *Theseus*, albeit in many small pieces and over a very long time. Some wondered if it could

build another crew as well, although we'd all been assured that was impossible. Not even these machines had fine enough fingers to reconstruct a few trillion synapses in the space of a human skull. Not yet, anyway.

I believed it. They would never have shipped us out fully-assembled if there'd been a cheaper alternative.

I faced forward. Putting the back of my head against that sealed hatch I could see almost to *Theseus'* bow, an uninterrupted line-of-sight extending to a tiny dark bull's-eye thirty meters ahead. It was like staring at a great textured target in shades of white and gray: concentric circles, hatches centered within bulkheads one behind another, perfectly aligned. Every one stood open, in nonchalant defiance of a previous generation's safety codes. We could keep them closed if we wanted to, if it made us feel safer. That was all it would do, though; it wouldn't improve our empirical odds one whit. In the event of trouble those hatches would slam shut long milliseconds before Human senses could even make sense of an alarm. They weren't even computer-controlled. *Theseus'* body parts had *reflexes*.

I pushed off against the stern plating—wincing at the tug and stretch of disused tendons—and coasted forward, leaving Fab behind. The shuttle-access hatches to *Scylla* and *Charybdis* briefly constricted my passage to either side. Past them the spine widened into a corrugated extensible cylinder two meters across and—at the moment—maybe fifteen long. A pair of ladders ran opposite each other along its length; raised portholes the size of manhole covers stippled the bulkhead to either side. Most of those just looked into the hold. A couple served as general-purpose airlocks, should anyone want to take a stroll beneath the carapace. One opened into my tent. Another, four meters further forward, opened into Bates'.

From a third, just short of the forward bulkhead, Jukka Sarasti climbed into view like a long white spider.

If he'd been Human I'd have known instantly what I saw there, I'd have smelled *murderer* all over his topology. And I wouldn't have been able to even guess at the number of his

victims, because his affect was so utterly without remorse. The killing of a hundred would leave no more stain on Sarasti's surfaces than the swatting of an insect; guilt beaded and rolled off this creature like water on wax.

But Sarasti wasn't human. Sarasti was a whole different animal, and coming from him all those homicidal refractions meant nothing more than *predator*. He had the inclination, was born to it; whether he had ever acted on it was between him and Mission Control.

Maybe they cut you some slack, I didn't say to him. Maybe it's just a cost of doing business. You're mission-critical, after all. For all I know you cut a deal. You're so very smart, you know we wouldn't have brought you back in the first place if we hadn't needed you. From the day they cracked the vat you knew you had leverage.

Is that how it works, Jukka? You save the world, and the folks who hold your leash agree to look the other way?

As a child I'd read tales about jungle predators transfixing their prey with a stare. Only after I'd met Jukka Sarasti did I know how it felt. But he wasn't looking at me now. He was focused on installing his own tent, and even if he *had* looked me in the eye there'd have been nothing to see but the dark wraparound visor he wore in deference to Human skittishness. He ignored me as I grabbed a nearby rung and squeezed past.

I could have sworn I smelled raw meat on his breath.

Into the drum (*drums*, technically; the BioMed hoop at the back spun on its own bearings). I flew through the center of a cylinder sixteen meters across. *Theseus'* spinal nerves ran along its axis, the exposed plexii and piping bundled against the ladders on either side. Past them, Szpindel's and James' freshly-erected tents rose from nooks on opposite sides of the world. Szpindel himself floated off my shoulder, still naked but for his gloves, and I could tell from the way his fingers moved that his favorite color was green. He anchored himself to one of three stairways to nowhere arrayed around the drum: steep narrow steps rising five vertical meters from the deck into empty air.

The next hatch gaped dead-center of the drum's forward wall; pipes and conduits plunged into the bulkhead to each side. I

grabbed a convenient rung to slow myself—biting down once more on the pain—and floated through.

T-junction. The spinal corridor continued forward, a smaller diverticulum branched off to an EVA cubby and the forward airlock. I stayed the course and found myself back in the crypt, mirror-bright and less than two meters deep. Empty pods gaped to the left; sealed ones huddled to the right. We were so irreplaceable we'd come with replacements. They slept on, oblivious. I'd met three of them back in training. Hopefully none of us would be getting reacquainted any time soon.

Only four pods to starboard, though. No backup for Sarasti.

Another hatchway. Smaller this time. I squeezed through into the bridge. Dim light there, a silent shifting mosaic of icons and alphanumerics iterating across dark glassy surfaces. Not so much bridge as cockpit, and a cramped one at that. I'd emerged between two acceleration couches, each surrounded by a horseshoe array of controls and readouts. Nobody expected to ever *use* this compartment. *Theseus* was perfectly capable of running herself, and if she wasn't we were capable of running her from our inlays, and if we weren't the odds were overwhelming that we were all dead anyway. Still, against that astronomically off-the-wall chance, this was where one or two intrepid survivors could pilot the ship home again after everything else had failed.

Between the footwells the engineers had crammed one last hatch and one last passageway: to the observation blister on *Theseus'* prow. I hunched my shoulders (tendons cracked and complained) and pushed through—

—into darkness. Clamshell shielding covered the outside of the dome like a pair of eyelids squeezed tight. A single icon glowed softly from a touchpad to my left; faint stray light followed me through from the spine, brushed dim fingers across the concave enclosure. The dome resolved in faint shades of blue and gray as my eyes adjusted. A stale draft stirred the webbing floating from the rear bulkhead, mixed oil and machinery at the back of my throat. Buckles clicked faintly in the breeze like impoverished wind chimes.

I reached out and touched the crystal: the innermost layer of two, warm air piped through the gap between to cut the cold. Not completely, though. My fingertips chilled instantly.

Space out there.

Perhaps, en route to our original destination, *Theseus* had seen something that scared her clear out of the solar system. More likely she hadn't been running away from anything but *to* something else, something that hadn't been discovered until we'd already died and gone from Heaven. In which case...

I reached back and tapped the touchpad. I half-expected nothing to happen; *Theseus'* windows could be as easily locked as her comm logs. But the dome split instantly before me, a crack then a crescent then a wide-eyed lidless stare as the shielding slid smoothly back into the hull. My fingers clenched reflexively into a fistful of webbing. The sudden void stretched empty and unforgiving in all directions, and there was nothing to cling to but a metal disk barely four meters across.

Stars, everywhere. So many stars that I could not for the life me understand how the sky could contain them all yet be so black. Stars, and—

—nothing else.

What did you expect? I chided myself. *An alien mothership hanging off the starboard bow?*

Well, why not? We were out here for *something*.

The others were, anyway. They'd be essential no matter where we'd ended up. But my own situation was a bit different, I realized. *My* usefulness degraded with distance.

And we were over half a light year from home.

WHEN IT IS DARK ENOUGH, YOU CAN SEE THE STARS.

—RALPH WALDO EMERSON

WHERE WAS I when the lights came down?

I was emerging from the gates of Heaven, mourning a father

who was—to his own mind, at least—still alive.

It had been scarcely two months since Helen had disappeared under the cowl. Two months by our reckoning, at least. From her perspective it could have been a day or a decade; the Virtually Omnipotent set their subjective clocks along with everything else.

She wasn't coming back. She would only deign to see her husband under conditions that amounted to a slap in the face. He didn't complain. He visited as often as she would allow: twice a week, then once. Then every two. Their marriage decayed with the exponential determinism of a radioactive isotope and still he sought her out, and accepted her conditions.

On the day the lights came down, I had joined him at my mother's side. It was a special occasion, the last time we would ever see her in the flesh. For two months her body had lain in state along with five hundred other new ascendants on the ward, open for viewing by the next of kin. The interface was no more real than it would ever be, of course; the body could not talk to us. But at least it was *there*, its flesh warm, the sheets clean and straight. Helen's lower face was still visible below the cowl, though eyes and ears were helmeted. We could touch her. My father often did. Perhaps some distant part of her still felt it.

But eventually someone has to close the casket and dispose of the remains. Room must be made for the new arrivals—and so we came to this last day at my mother's side. Jim took her hand one more time. She would still be available in her world, on her terms, but later this day the body would be packed into storage facilities crowded far too efficiently for flesh and blood visitors. We had been assured that the body would remain intact—the muscles electrically exercised, the body flexed and fed, the corpus kept ready to return to active duty should Heaven experience some inconceivable and catastrophic meltdown. Everything was reversible, we were told. And yet—there were so many who had ascended, and not even the deepest catacombs go on forever. There were rumors of dismemberment, of nonessential body parts hewn away over time according to some optimum-packing algorithm. Perhaps

Helen would be a torso this time next year, a disembodied head the year after. Perhaps her chassis would be stripped down to the brain before we'd even left the building, awaiting only that final technological breakthrough that would herald the arrival of the Great Digital Upload.

Rumors, as I say. I personally didn't know of anyone who'd come back after ascending, but then why would anyone want to? Not even Lucifer left Heaven until he was pushed.

Dad might have known for sure—Dad knew more than most people, about the things most people weren't supposed to know—but he never told tales out of turn. Whatever he knew, he'd obviously decided its disclosure wouldn't have changed Helen's mind. That would have been enough for him.

We donned the hoods that served as day passes for the Unwired, and we met my mother in the spartan visiting room she imagined for these visits. She'd built no windows into the world she occupied, no hint of whatever utopian environment she'd constructed for herself. She hadn't even opted for one of the prefab visiting environments designed to minimize dissonance among visitors. We found ourselves in a featureless beige sphere five meters across. There was nothing in there but her.

Maybe not so far removed from her vision of utopia after all, I thought.

My father smiled. "Helen."

"Jim." She was twenty years younger than the thing on the bed, and still she made my skin crawl. "Siri! You came!"

She always used my name. I don't think she ever called me *son*.

"You're still happy here?" my father asked.

"Wonderful. I do wish you could join us."

Jim smiled. "Someone has to keep the lights on."

"Now you *know* this isn't goodbye," she said. "You can visit whenever you like."

"Only if you do something about the scenery." Not just a joke, but a lie; Jim would have come at her call even if the gauntlet involved bare feet and broken glass.

"And Chelsea, too," Helen continued. "It would be so nice to finally meet her after all this time."

"Chelsea's *gone*, Helen," I said.

"Oh yes but I know you stay in touch. I know she was special to you. Just because you're not *together* any more doesn't mean she can't—"

"*You know she—*"

A startling possibility stopped me in mid-sentence: maybe I hadn't actually told them.

"Son," Jim said quietly. "Maybe you could give us a moment."

I would have given them a fucking lifetime. I unplugged myself back to the ward, looked from the corpse on the bed to my blind and catatonic father in his couch, murmuring sweet nothings into the datastream. Let them perform for each other. Let them formalize and finalize their so-called relationship in whatever way they saw fit. Maybe, just once, they could even bring themselves to be honest, there in that other world where everything else was a lie. Maybe.

I felt no desire to bear witness either way.

But of course I had to go back in for my own formalities. I adopted my role in the familial set-piece one last time, partook of the usual lies. We all agreed that this wasn't going to change anything, and nobody deviated enough from the script to call anyone else a liar on that account. And finally—careful to say *until next time* rather than *goodbye*—we took our leave of my mother.

I even suppressed my gag reflex long enough to give her a hug.

Jim had his inhaler in hand as we emerged from the darkness. I hoped, without much hope, that he'd throw it into the garbage receptacle as we passed through the lobby. But he raised it to his mouth and took another hit of vassopressin, that he would never be tempted.

Fidelity in an aerosol. "You don't need that any more," I said.

"Probably not," he agreed.

"It won't work anyway. You can't imprint on someone who isn't even there, no matter how many hormones you snort. It just—"

Jim said nothing. We passed beneath the muzzles of sentries panning for infiltrating Realists.

"She's gone," I blurted. "She doesn't care if you find someone else. She'd be happy if you did." *It would let her pretend the books had been balanced.*

"She's my wife," he told me.

"That doesn't mean what it used to. It never did."

He smiled a bit at that. "It's my life, son. I'm comfortable with it."

"Dad—"

"I don't blame her," he said. "And neither should you."

Easy for him to say. Easy even to accept the hurt she'd inflicted on him all these years. This cheerful façade here at the end hardly made up for the endless bitter complaints my father had endured throughout living memory. *Do you think it's easy when you disappear for months on end? Do you think it's easy always wondering who you're with and what you're doing and if you're even alive? Do you think it's easy raising a child like that on your own?*

She'd blamed him for everything, but he bore it gracefully because he knew it was all a lie. He knew he was only the pretense. She wasn't leaving because he was AWOL, or unfaithful. Her departure had nothing to do with him at all. It was me. Helen had left the world because she couldn't stand to look at the thing who'd replaced her son.

I would have pursued it—would have tried yet again to make my father see—but by now we'd left the gates of Heaven for the streets of Purgatory, where pedestrians on all sides murmured in astonishment and stared open-mouthed at the sky. I followed their gaze to a strip of raw twilight between the towers, and gasped—

The stars were falling.

The Zodiac had rearranged itself into a precise grid of bright points with luminous tails. It was as though the whole planet had been caught in some great closing net, the knots of its mesh aglow with St. Elmo's fire. It was beautiful. It was terrifying.

I looked away to recalibrate my distance vision, to give this ill-behaved hallucination a chance to vanish gracefully before I set my empirical gaze to high-beam. I saw a vampire in that moment, a female, walking among us like the archetypal wolf in sheep's clothing. Vampires were uncommon creatures at street level. I'd never seen one in the flesh before.

She had just stepped onto the street from the building across the way. She stood a head taller than the rest of us, her eyes shining yellow and bright as a cat's in the deepening dark. She realized, as I watched, that something was amiss. She looked around, glanced at the sky—and continued on her way, totally indifferent to the cattle on all sides, to the heavenly portent that had transfixed them. Totally indifferent to the fact that the world had just turned inside-out.

It was 1035 Greenwich Mean Time, February 13, 2082.

They clenched around the world like a fist, each black as the inside of an event horizon until those last bright moments when they all burned together. They screamed as they died. Every radio up to geostat groaned in unison, every infrared telescope went briefly snowblind. Ashes stained the sky for weeks afterwards; mesospheric clouds, high above the jet stream, turned to glowing rust with every sunrise. The objects, apparently, consisted largely of iron. Nobody ever knew what to make of that.

For perhaps the first time in history, the world *knew* before being *told*: if you'd seen the sky, you had the scoop. The usual arbiters of newsworthiness, stripped of their accustomed role in filtering reality, had to be content with merely labeling it. It took them ninety minutes to agree on *Fireflies*. A half hour after

that, the first Fourier transforms appeared in the noosphere; to no one's great surprise, the Fireflies had not wasted their dying breaths on static. There was pattern embedded in that terminal chorus, some cryptic intelligence that resisted all earthly analysis. The experts, rigorously empirical, refused to speculate: they only admitted that the Fireflies had said *something*. They didn't know what.

Everyone else did. How else would you explain 65,536 probes evenly dispersed along a lat-long grid that barely left any square meter of planetary surface unexposed? Obviously the Flies had taken our picture. The whole world had been caught with its pants down in panoramic composite freeze-frame. We'd been *surveyed*—whether as a prelude to formal introductions or outright invasion was anyone's guess.

My father might have known someone who might have known. But by then he'd long since disappeared, as he always did during times of hemispheric crisis. Whatever he knew or didn't, he left me to find my own answers with everyone else.

There was no shortage of perspectives. The noosphere seethed with scenarios ranging from utopian to apocalyptic. The Fireflies had seeded lethal germs through the jet stream. The Fireflies had been on a nature safari. The Icarus Array was being retooled to power a doomsday weapon against the aliens. The Icarus Array had already been destroyed. We had decades to react; anything from another solar system would have to obey the lightspeed limit like everyone else. We had days to live; organic warships had just crossed the asteroid belt and would be fumigating the planet within a week.

Like everyone else, I bore witness to lurid speculations and talking heads. I visited blathernodes, soaked myself in other people's opinions. That was nothing new, as far as it went; I'd spent my whole life as a sort of alien ethologist in my own right, watching the world behave, gleaning patterns and protocols, learning the rules that allowed me to infiltrate human society. It had always worked before. Somehow, though, the presence of *real* aliens had changed the dynamics of the equation. Mere observation didn't satisfy any more. It was as

though the presence of this new outgroup had forced me back into the clade whether I liked it or not; the distance between myself and the world suddenly seemed forced and faintly ridiculous.

Yet I couldn't, for my life, figure out how to let it go.

Chelsea had always said that telepresence emptied the Humanity from Human interaction. "They say it's indistinguishable," she told me once, "just like having your family right there, snuggled up so you can see them and feel them and smell them next to you. But it's not. It's just shadows on the cave wall. I mean, sure, the shadows come in three-dee color with force-feedback tactile interactivity. They're good enough to fool the civilized brain. But your gut knows those aren't *people*, even if it can't put its finger on *how* it knows. They just don't *feel* real. Know what I mean?"

I didn't. Back then I'd had no clue what she was talking about. But now we were all cavemen again, huddling beneath some overhang while lightning split the heavens and vast formless monsters, barely glimpsed in bright strobe-frozen instants, roared and clashed in the darkness on all sides. There was no comfort in solitude. You couldn't get it from interactive shadows. You needed someone *real* at your side, someone to hold on to, someone to share your airspace along with your fear and hope and uncertainty.

I imagined the presence of companions who wouldn't vanish the moment I unplugged. But Chelsea was gone, and Pag in her wake. The few others I could have called—peers and former clients with whom my impersonations of rapport had been especially convincing—didn't seem worth the effort. Flesh and blood had its own relationship to reality: necessary, but not sufficient.

Watching the world from a distance, it occurred to me at last: I knew exactly what Chelsea had meant, with her Luddite ramblings about desaturated Humanity and the colorless interactions of virtual space. I'd known all along.

I'd just never been able to see how it was any different from real life.

Imagine you are a machine.

Yes, I know. But imagine you're a different *kind* of machine, one built from metal and plastic and designed not by blind, haphazard natural selection but by engineers and astrophysicists with their eyes fixed firmly on specific goals. Imagine that your purpose is not to replicate, or even to survive, but to gather information.

I can imagine that easily. It is in fact a much simpler impersonation than the kind I'm usually called on to perform.

I coast through the abyss on the colder side of Neptune's orbit. Most of the time I exist only as an absence, to any observer on the visible spectrum: a moving, asymmetrical silhouette blocking the stars. But occasionally, during my slow endless spin, I glint with dim hints of reflected starlight. If you catch me in those moments you might infer something of my true nature: a segmented creature with foil skin, bristling with joints and dishes and spindly antennae. Here and there a whisper of accumulated frost clings to a joint or seam, some frozen wisp of gas encountered in Jupiter space perhaps. Elsewhere I carry the microscopic corpses of Earthly bacteria who thrived with carefree abandon on the skins of space stations or the benign lunar surface—but who had gone to crystal at only half my present distance from the sun. Now, a breath away from Absolute Zero, they might shatter at a photon's touch.

My heart is warm, at least. A tiny nuclear fire burns in my thorax, leaves me indifferent to the cold outside. It won't go out for a thousand years, barring some catastrophic accident; for a thousand years, I will listen for faint voices from Mission Control and do everything they tell me to. So far they have told me to study comets. Every instruction I have ever received has been a precise and unambiguous elaboration on that one overriding reason for my existence.

Which is why these latest instructions are so puzzling, for

they make no sense at all. The frequency is wrong. The signal strength is wrong. I cannot even understand the handshaking protocols. I request clarification.

The response arrives almost a thousand minutes later, and it is an unprecedented mix of orders and requests for information. I answer as best I can: yes, this is the bearing at which signal strength was greatest. No, it is not the usual bearing for Mission Control. Yes, I can retransmit: here it is, all over again. Yes, I will go into standby mode.

I await further instructions. They arrive 839 minutes later, and they tell me to stop studying comets immediately.

I am to commence a controlled precessive tumble that sweeps my antennae through consecutive 5°-arc increments along all three axes, with a period of 94 seconds. Upon encountering any transmission resembling the one which confused me, I am to fix upon the bearing of maximal signal strength and derive a series of parameter values. I am also instructed to retransmit the signal to Mission Control.

I do as I'm told. For a long time I hear nothing, but I am infinitely patient and incapable of boredom. Eventually a fleeting, familiar signal brushes against my afferent array. I reacquire and track it to source, which I am well-equipped to describe: a trans-Neptunian comet in the Kuiper Belt, approximately two hundred kilometers in diameter. It is sweeping a 21-cm tightbeam radio wave across the heavens with a periodicity of 4.57 seconds. This beam does not intersect Mission Control's coordinates at any point. It appears to be directed at a different target entirely.

It takes much longer than usual for Mission Control to respond to this information. When it does, it tells me to change course. Mission Control informs me that henceforth my new destination is to be referred to as *Burns-Caulfield*. Given current fuel and inertial constraints I will not reach it in less than thirty-nine years.

I am to watch nothing else in the meantime.

I'd been liaising for a team at the Kurzweil Institute, a fractured group of cutting-edge savants convinced they were on the verge of solving the quantum-glia paradox. That particular log-jam had stalled AI for decades; once broken, the experts promised we'd be eighteen months away from the first personality upload and only two years from reliable Human-consciousness emulation in a software environment. It would spell the end of corporeal history, usher in a Singularity that had been waiting impatiently in the wings for nigh on fifty years.

Two months after Firefall, the Institute cancelled my contract.

I was actually surprised it had taken them so long. It had cost us so much, this overnight inversion of global priorities, these breakneck measures making up for lost initiative. Not even our shiny new post-scarcity economy could withstand such a seismic shift without lurching towards bankruptcy. Installations in deep space, long since imagined secure by virtue of their remoteness, were suddenly vulnerable for exactly the same reason. Lagrange habitats had to be refitted for defense against an unknown enemy. Commercial ships on the Martian Loop were conscripted, weaponised, and reassigned; some secured the high ground over Mars while others fell sunward to guard the Icarus Array.

It didn't matter that the Fireflies hadn't fired a shot at any of these targets. We simply couldn't afford the risk.

We were all in it together, of course, desperate to regain some hypothetical upper hand by any means necessary. Kings and corporations scribbled IOUs on the backs of napkins and promised to sort everything out once the heat was off. In the meantime, the prospect of Utopia in two years took a back seat to the shadow of Armageddon reaching back from next Tuesday. The Kurzweil Institute, like everyone else, suddenly had other things to worry about.

So I returned to my apartment, split a bulb of Glenfiddich,

and arrayed virtual windows like daisy petals in my head.
Everyone Icons debated on all sides, serving up leftovers two
weeks past their expiry date:

Disgraceful breakdown of global security.

No harm done.

Comsats annihilated. Thousands dead.

Random collisions. Accidental deaths.

(who sent them?)

We should have seen them coming. Why didn't we—

Deep space. Inverse square. Do the math.

They were stealthed!

(what do they want?)

We were raped!

Jesus Christ. They just took our picture.

Why the silence?

Moon's fine. Mars's fine.

(Where are they?)

Why haven't they made contact?

Nothing's touched the O'Neills.

Technology Implies Belligerence!

(Are they coming back?)

Nothing attacked us.

Yet.

Nothing *invaded*.

So far.

JIM MOORE VOICE ONLY

ENCRYPTED

ACCEPT?

The text window blossomed directly in my line of sight,
eclipsing the debate. I read it twice. I tried to remember the last
time he'd called from the field, and couldn't.

I muted the other windows. "Dad?"

"Son," he replied after a moment. "Are you well?"

"Like everyone else. Still wondering whether we should be
celebrating or crapping our pants."

He didn't answer immediately. "It's a big question, all right,"

he said at last.

"I don't suppose you could give me any advice? They're not telling us anything at ground level."

It was a rhetorical request. His silence was hardly necessary to make the point. "I know," I added after a moment. "Sorry. It's just, they're saying the Icarus Array went down, and—"

"You know I can't—oh." My father paused. "That's ridiculous. Icarus's fine."

"It is?"

He seemed to be weighing his words. "The Fireflies probably didn't even notice it. There's no particle trail as long as it stays offstream, and it would be buried in solar glare unless someone knew where to search."

It was my turn to fall silent. This conversation felt suddenly *wrong*.

Because when my father went on the job, he went dark. He *never* called his family.

Because even when my father came *off* the job, he never talked about it. It wouldn't matter whether the Icarus Array was still online or whether it had been shredded and thrown into the sun like a thousand kilometers of torn origami; he wouldn't tell either tale unless an official announcement had been made. Which—I refreshed an index window just to be sure— it hadn't.

Because while my father was a man of few words, he was *not* a man of frequent, indecisive pauses—and he had hesitated before each and every line he'd spoken in this exchange.

I tugged ever-so-gently on the line—"But they've sent ships."—and started counting.

One one-thousand, two one-thousand—

"Just a precaution. Icarus was overdue for a visit anyway. You don't swap out your whole grid without at least dropping in and kicking the new tires first."

Nearly three seconds to respond.

"You're on the moon," I said.

Pause. "Close enough."

"What are you—Dad, why are you telling me this? Isn't this a security breach?"

"You're going to get a call," he told me.

"From who? Why?"

"They're assembling a team. The kind of—people you deal with." My father was too rational to dispute the contributions of the recons and hybrids in our midst, but he'd never been able to hide his mistrust of them.

"They need a synthesist," he said.

"Isn't it lucky you've got one in the family."

Radio bounced back and forth. "This isn't nepotism, Siri. I wanted very much for them to pick someone else."

"Thanks for the vote of conf—"

But he'd seen it coming, and preempted me before my words could cross the distance: "It's not a slap at your abilities and you know it. You're simply the most qualified, and the work is vital."

"So why—" I began, and stopped. He wouldn't want to keep me away from some theoretical gig in a WestHem lab.

"What's this about, Dad?"

"The Fireflies. They found something."

"*What?*"

"A radio signal. From the Kuiper. We traced the bearing."

"They're *talking?*"

"Not to us." He cleared his throat. "It was something of a fluke that we even intercepted the transmission."

"Who are they talking to?"

"We don't know."

"Friendly? Hostile?"

"Son, we don't *know*. The encryption seems similar, but we can't even be sure of that. All we have is the location."

"So you're sending a team." *You're sending* me. We'd never gone to the Kuiper before. It had been decades since we'd even sent robots. Not that we lacked the capacity. We just hadn't bothered; everything we needed was so much closer to home. The Interplanetary Age had stagnated at the asteroids.

But now something lurked at the furthest edge of our backyard, calling into the void. Maybe it was talking to some other solar system. Maybe it was talking to something closer,

something *en route*.

"It's not the kind of situation we can safely ignore," my father said.

"What about probes?"

"Of course. But we can't wait for them to report back. The follow-up's been fast-tracked; updates can be sent *en route*."

He gave me a few extra seconds to digest that. When I still didn't speak, he said, "You have to understand. Our only edge is that as far as we know, Burns-Caulfield doesn't know we're on to it. We have to get as much as we can in whatever window of opportunity that grants us."

But *Burns-Caulfield* had hidden itself. *Burns-Caulfield* might not welcome a forced introduction.

"What if I refuse?"

The timelag seemed to say *Mars*.

"I know you, son. You won't."

"But if I *did*. If I'm the best qualified, if the job's so vital..."

He didn't have to answer. I didn't have to ask. At these kind of stakes, mission-critical elements didn't get the luxury of choice. I wouldn't even have the childish satisfaction of holding my breath and refusing to play—the will to resist is no less mechanical than the urge to breathe. Both can be subverted with the right neurochemical keys.

"You killed my Kurzweill contract," I realized.

"That's the least of what we did."

We let the vacuum between us speak for a while.

"If I could go back and undo the—the thing that made you what you are," Dad said after a while, "I would. In a second."

"Yeah."

"I have to go. I just wanted to give you the heads-up."

"Yeah. Thanks."

"I love you, son."

Where are you? Are you coming back?

"Thanks," I said again. "That's good to know."

This is what my father could not unmake. This is what I am:

I am the bridge between the bleeding edge and the dead center. I stand between the Wizard of Oz and the man behind the curtain.

I *am* the curtain.

I am not an entirely new breed. My roots reach back to the dawn of civilization but those precursors served a different function, a less honorable one. They only greased the wheels of social stability; they would sugarcoat unpleasant truths, or inflate imaginary bogeymen for political expedience. They were vital enough in their way. Not even the most heavily-armed police state can exert brute force on all of its citizens all of the time. Meme management is so much subtler; the rose-tinted refraction of perceived reality, the contagious fear of threatening alternatives. There have always been those tasked with the rotation of informational topologies, but throughout most of history they had little to do with increasing its *clarity*.

The new Millennium changed all that. We've surpassed ourselves now, we're exploring terrain beyond the limits of merely human understanding. Sometimes its contours, even in conventional space, are just too intricate for our brains to track; other times its very axes extend into dimensions inconceivable to minds built to fuck and fight on some prehistoric grassland. So many things constrain us, from so many directions. The most altruistic and sustainable philosophies fail before the brute brain-stem imperative of self-interest. Subtle and elegant equations *predict* the behavior of the quantum world, but none can *explain* it. After four thousand years we can't even prove that reality exists beyond the mind of the first-person dreamer. We have such need of intellects greater than our own.

But we're not very good at building them. The forced matings of minds and electrons succeed and fail with equal spectacle. Our hybrids become as brilliant as savants, and as autistic. We graft people to prosthetics, make their overloaded motor strips juggle meat and machinery, and shake our heads when their fingers twitch and their tongues stutter. Computers bootstrap their own offspring, grow so wise and incomprehensible that

their communiqués assume the hallmarks of dementia: unfocused and irrelevant to the barely-intelligent creatures left behind.

And when your surpassing creations find the answers you asked for, you can't understand their analysis and you can't verify their answers. You have to take their word on faith—

—Or you use information theory to *flatten* it for you, to squash the tesseract into two dimensions and the Klein bottle into three, to simplify reality and pray to whatever Gods survived the millennium that your honorable twisting of the truth hasn't ruptured any of its load-bearing pylons. You hire people like me; the crossbred progeny of profilers and proof assistants and information theorists.

In formal settings you'd call me Synthesist. On the street you call me *jargonaut* or *poppy*. If you're one of those savants whose hard-won truths are being bastardized and lobotomized for powerful know-nothings interested only in market share, you might call me a *mole* or a *chaperone*.

If you're Isaac Szpindel you'd call me *commissar*, and while the jibe would be a friendly one, it would also be more than that.

I've never convinced myself that we made the right choice. I can cite the usual justifications in my sleep, talk endlessly about the rotational topology of information and the irrelevance of semantic comprehension. But after all the words, I'm still not sure. I don't know if anyone else is, either. Maybe it's just some grand consensual con, marks and players all in league. We won't admit that our creations are beyond us; they may speak in tongues, but our priests can read those signs. Gods leave their algorithms carved into the mountainside but it's just li'l ol' me bringing the tablets down to the masses, and I don't threaten anyone.

Maybe the Singularity happened years ago. We just don't want to admit we were left behind.

ALL KINDS OF ANIMALS COMING HERE. OCCASIONAL
DEMONS TOO.

—IAN ANDERSON, *CATFISH RISING*

THE THIRD WAVE, they called us. All in the same boat, driving into the long dark courtesy of a bleeding-edge prototype crash-graduated from the simulators a full eighteen months ahead of schedule. In a less fearful economy, such violence to the timetable would have bankrupted four countries and fifteen multicorps.

The first two waves came out of the gate in even more of a hurry. I didn't find out what had happened to them until thirty minutes before the briefing, when Sarasti released the telemetry into ConSensus. Then I opened wide; experience flooded up my inlays and spilled across my parietal cortex in glorious high-density fast forward. Even now I can bring those data back, fresh as the day they were recorded. I'm *there*.

I'm *them*.

I am unmanned. I am disposable. I am souped-up and stripped-down, a telematter drive with a couple of cameras bolted to the front end, pushing gees that would turn meat to jelly. I sprint joyously toward the darkness, my twin brother a stereoscopic hundred klicks to starboard, dual streams of backspat pions boosting us to relativity before poor old Theseus had even crawled past Mars.

But now, six billion kilometers to stern, Mission Control turns off the tap and leaves us coasting. The comet swells in our sights, a frozen enigma sweeping its signal across the sky like a lighthouse beam. We bring rudimentary senses to bear and stare it down on a thousand wavelengths.

We've lived for this moment.

We see an erratic wobble that speaks of recent collisions. We see scars—smooth icy expanses where once-acned skin has liquefied and refrozen, far too recently for the insignificant sun at our backs to be any kind of suspect.

We see an astronomical impossibility: a comet with a heart of

refined iron.

Burns-Caufield sings as we glide past. Not to us; it ignores our passage as it ignored our approach. It sings to someone else entirely. Perhaps we'll meet that audience some day. Perhaps they're waiting in the desolate wastelands ahead of us. Mission Control flips us onto our backs, keeps us fixed on target past any realistic hope of acquisition. They send last-ditch instructions, squeeze our fading signals for every last bit among the static. I can sense their frustration, their reluctance to let us go; once or twice, we're even asked if some judicious mix of thrust and gravity might let us linger here a bit longer.

But deceleration is for pansies. We're headed for the stars.

Bye, Burnsie. Bye, Mission Control. Bye, Sol.

See you at heat death.

Warily, we close on target.

There are three of us in the second wave—slower than our predecessors, yes, but still so much faster than anything flesh-constrained. We are weighed down by payloads which make us virtually omniscient. We see on every wavelength, from radio to string. Our autonomous microprobes measure everything our masters anticipated; tiny onboard assembly lines can build tools from the atoms up, to assess the things they did not. Atoms, scavenged from where we are, join with ions beamed from where we were: thrust and materiel accumulate in our bellies.

This extra mass has slowed us, but midpoint braking maneuvers have slowed us even more. The last half of this journey has been a constant fight against momentum from the first. It is not an efficient way to travel. In less-hurried times we would have built early to some optimal speed, perhaps slung around a convenient planet for a little extra oomph, coasted most of the way. But time is pressing, so we burn at both ends. We must reach our destination; we cannot afford to pass it by, cannot afford the kamikaze exuberance of the first wave. They merely glimpsed the lay of the land. We must map

it down to the motes.

We must be more responsible.

Now, slowing towards orbit, we see everything they saw and more. We see the scabs, and the impossible iron core. We hear the singing. And there, just beneath the comet's frozen surface, we see structure: an infiltration of architecture into geology. We are not yet close enough to squint, and radar is too long in the tooth for fine detail. But we are smart, and there are three of us, widely separated in space. The wavelengths of three radar sources can be calibrated to interfere at some predetermined point of convergence—and those tripartite echoes, hologramatically remixed, will increase resolution by a factor of twenty-seven.

Burns-Caulfield stops singing the moment we put our plan into action. In the next instant I go blind.

It's a temporary aberration, a reflexive amping of filters to compensate for the overload. My arrays are back online in seconds, diagnostics green within and without. I reach out to the others, confirm identical experiences, identical recoveries. We are all still fully functional, unless the sudden increase in ambient ion density is some kind of sensory artefact. We are ready to continue our investigation of Burns-Caulfield.

The only real problem is that Burns-Caulfield seems to have disappeared...

Theseus carried no regular crew—no navigators or engineers, no one to swab the decks, no meat wasted on tasks that machinery orders of mag smaller could perform orders of mag better. Let superfluous deckhands weigh down other ships, if the nonAscendent hordes needed to attach some pretense of usefulness to their lives. Let them infest vessels driven only by commercial priorities. The only reason we were here was because nobody had yet optimized software for First Contact. Bound past the edge of the solar system, already freighted with the fate of the world, *Theseus* wasted no mass on self-esteem.

So here we were, rehydrated and squeaky-clean: Isaac Szpindel, to study the aliens. The Gang of Four—Susan James and her secondary personae—to talk to them. Major Amanda Bates was here to fight, if necessary. And Jukka Sarasti to command us all, to move us like chess pieces on some multidimensional game board that only vampires could see.

He'd arrayed us around a conference table that warped gently through the Commons, keeping a discreet and constant distance from the curved deck beneath. The whole drum was furnished in Early Concave, tricked unwary and hung-over brains into thinking they were looking at the world through fisheye lenses. In deference to the creakiness of the *nouveaux undead* it spun at a mere fifth of a gee, but it was just warming up. We'd be at half-grav in six hours, stuck there for eighteen out of every twenty-four until the ship decided we were fully recovered. For the next few days, free-fall would be a rare and blessed thing.

Light sculptures appeared on the tabletop. Sarasti could have fed the information directly to our inlays—the whole briefing could have gone through ConSensus, without the need to assemble physically in the same place—but if you want to be sure everyone's paying attention, you bring them together.

Szpindel leaned in conspiratorially at my side. "Or maybe the bloodsucker just gets off seeing all this meat in close quarters, eh?"

If Sarasti heard he didn't show it, not even to me. He pointed to a dark heart at the center of the display, his eyes lost behind black glass. "Oasa object. Infrared emitter, methane class."

On the display it was—nothing. Our apparent destination was a black disk, a round absence of stars. In real life it weighed in at over ten Jupiters and measured twenty percent wider at the belly. It was directly in our path: too small to burn, too remote for the reflection of distant sunlight, too heavy for a gas giant, too light for a brown dwarf.

"When did *that* show up?" Bates squeezed her rubber ball in one hand, the knuckles whitening.

"X-ray spike appears during the '76 microwave survey." Six years before Firefall. "Never confirmed, never reacquired. Like a

torsion flare from an L-class dwarf, but we should see anything big enough to generate that kind of effect and the sky's dark on that bearing. IAU calls it a statistical artefact."

Szpindel's eyebrows drew together like courting caterpillars. "What changed?"

Sarasti smiled faintly, keeping his mouth closed. "The metabase gets—*crowded*, after Firefall. Everyone *skittish*, looking for clues. After Burns-Caulfield explodes—" He clicked at the back of his throat. "Turns out the spike might arise from a subdwarf object after all, if the magnetosphere's torqued enough."

Bates: "Torqued by what?"

"Don't know."

Layers of statistical inference piled up on the table while Sarasti sketched background: even with a solid bearing and half the world's attention, the object had hidden from all but the most intensive search. A thousand telescopic snapshots had been stacked one on another and squeezed through a dozen filters before something emerged from the static, just below the three-meter band and the threshold of certainty. For the longest time it hadn't even been real: just a probabilistic ghost until *Theseus* got close enough to collapse the waveform. A quantum particle, heavy as ten Jupiters.

Earthbound cartographers were calling it *Big Ben*. *Theseus* had barely passed Saturn's orbit when it showed up in the residuals. That discovery would have been moot for anyone else; no other ship caught en route could have packed enough fuel for anything but the long dejected loop back home. But *Theseus'* thin, infinitely attenuate fuel line reached all the way back to the sun; she could turn on the proverbial dime. We'd changed course in our sleep and the Icarus stream tracked our moves like a cat after prey, feeding us at lightspeed.

And here we were.

"Talk about long shots," Szpindel grumbled.

Across the table, Bates flicked her wrist. Her ball sailed over my head; I heard it bounce off the deck (*not the deck*, something in me amended: *handrail*). "We're assuming the comet was a

deliberate decoy, then."

Sarasti nodded. The ball ricocheted back into my line of sight high overhead and disappeared briefly behind the spinal bundle, looping through some eccentric, counterintuitive parabola in the drum's feeble grav.

"So they want to be left alone."

Sarasti steepled his fingers and turned his face in her direction. "That your recommendation?"

She wished it was. "No, sir. I'm just saying that Burns-Caulfield took a lot of resources and effort to set up. Whoever built it obviously values their anonymity and has the technology to protect it."

The ball bounced one last time and wobbled back towards the Commons. Bates half-hopped from her seat (she floated briefly), barely catching it on its way past. There remained a new-born-animal awkwardness to her movements, half Coriolis, half residual rigor. Still: a big improvement in four hours. The rest of the Humans were barely past the walking stage.

"Maybe it wasn't much trouble for *them* at all, eh?" Szpindel was musing. "Maybe it was dead easy."

"In which case they might or might not be as xenophobic, but they're even more advanced. We don't want to rush into this."

Sarasti turned back to the simmering graphics. "So?"

Bates kneaded the recovered ball with her fingertips. "The second mouse gets the cheese. We may have blown our top-of-the-line recon in the Kuiper, but we don't have to go in blind. Send in our own drones along separate vectors. Hold off on a close approach until we at least know whether we're dealing with friendlies or hostiles."

James shook her head. "If they were hostile, they could have packed the Fireflies with antimatter. Or sent one big object instead of sixty thousand little ones, let the impact take us out."

"The Fireflies only imply an initial curiosity," Bates said. "Who knows if they liked what they saw?"

"What if this whole *diversion* theory's just so much shit?"

I turned, briefly startled. James's mouth had made the words; *Sascha* had spoken them.

"You wanna stay hidden, you don't light up the sky with fucking *fireworks*," she continued. "You don't need a diversion if nobody's looking for you, and nobody's looking for you if you lie low. If they were so *curious*, they could've just snuck in a spycam."

"Risks detection," the vampire said mildly.

"Hate to break it, Jukka, but the *Fireflies* didn't exactly slip under the rad—"

Sarasti opened his mouth, closed it again. Filed teeth, briefly visible, clicked audibly behind his face. Tabletop graphics reflected off his visor, a band of writhing polychrome distortions where eyes should be.

Sascha shut up.

Sarasti continued. "They trade stealth for speed. By the time you react, they already have what they want." He spoke quietly, patiently, a well-fed predator explaining the rules of the game to prey that really should know better: *the longer it takes me to track you down, the more hope you have of escaping*.

But Sascha had already fled. Her surfaces had scattered like a flock of panicked starlings, and the next time Susan James' mouth opened, it was Susan James who spoke through it. "Sascha's aware of the current paradigm, Jukka. She's simply worried that it might be wrong."

"Got another we could trade it on?" Szpindel wondered. "More options? Longer warranty?"

"I don't know." James sighed. "I guess not. It's just—*odd*, that they'd want to actively mislead us. I'd hoped they were merely — well." She spread her hands. "Probably no big deal. I'm sure they'll still be willing to talk, if we handle the introductions right. We just need to be a little more cautious, perhaps..."

Sarasti unfolded himself from his chair and loomed over us. "We go in. What we know weighs against further delay."

Bates frowned and pitched her ball back into orbit. "Sir, all we actually *know* is that an Oasa emitter's in our path. We don't even know if there's anyone *there*."

"There is," Sarasti said. "They expect us."

Nobody spoke for a few seconds. Someone's joints cracked in

the silence.

"Er..." Szpindel began.

Without looking, Sarasti flicked out his arm and snatched Bates' returning ball from the air. "Ladar pings *Theseus* four hours forty-eight minutes ago. We respond with an identical signal. Nothing. Probe launches half-hour before we wake up. We don't go in blind, but we don't wait. They *see* us already. Longer we wait, greater risk of countermeasures."

I looked at the dark featureless placeholder on the table: bigger than Jupiter and we couldn't even see it yet. Something in the shadow of that mass had just reached out with casual, unimaginable precision and tapped us on the nose with a laser beam.

This was not going to be an even match.

Szpindel spoke for all of us: "You knew that all along? You're telling us *now*?"

This time Sarasti's smile was wide and toothy. It was as though a gash had opened in the lower half of his face.

Maybe it was a predator thing. He just couldn't help playing with his food.

It wasn't so much the way they looked. The elongate limbs, the pale skin, the canines and the extended mandible—noticeable, yes, even alien, but not disturbing, not *frightening*. Not even the eyes, really. The eyes of dogs and cats shine in the darkness; we don't shiver at the sight.

Not the way they looked. The way they *moved*.

Something in the reflexes, maybe. The way they held their limbs: like mantis limbs, long jointed things you just *knew* could reach out and snatch you from right across the room, any time they felt like it. When Sarasti looked at me—really *looked*, naked-eyed, unfiltered by the visor— a half-million years just melted away. The fact that he was extinct meant nothing. The fact that we'd come so far, grown strong enough to resurrect

our own nightmares to serve us...meant nothing. The genes aren't fooled. They know what to fear.

Of course, you had to experience it in person. Robert Paglini knew the theory of vampires down the molecules, but even with all those technical specs in his head he never really got it.

He called me, before we left. I hadn't been expecting it; ever since the roster had been announced our watches had blocked calls from anyone not explicitly contact-listed. I'd forgotten that Pag had been. We hadn't spoken since Chelsea. I'd given up on ever hearing from him again.

But there he was. "Pod-man." He smiled, a tentative overture.

"It's good to see you," I said, because that's what people said in similar situations.

"Yeah, well I saw your name in the noose. You've made it big, for a baseline."

"Not so big."

"Crap. You're the vanguard of the Human Race. You're our first, last, and only hope against the unknown. Man, you *showed* them." He held his fist up and shook it, vicariously triumphant.

Showing them had become a cornerstone of Robert Paglino's life. He'd really made it work for him, too, overcome the handicap of a natural birth with retrofits and enhancements and sheer bloody-mindedness. In a world in which Humanity had become redundant in unprecedented numbers, we'd both retained the status of another age: *working professional*.

"So you're taking orders from a vamp," he said now. "Talk about fighting fire with fire."

"I guess it's practice. Until we run up against the real thing."

He laughed. I couldn't imagine why. But I smiled back anyway.

It was good to see him.

"So, what are they like?" Pag asked.

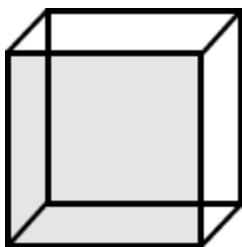
"Vampires? I don't know. Just met my first one yesterday."

"And?"

"Hard to read. Didn't even seem to be aware of his surroundings sometimes, he seemed to be... off in his own little world."

"He's aware all right. Those things are so fast it's scary. You know they can hold both aspects of a Necker cube in their heads at the same time?"

The term rang a bell. I subtitled, and saw the thumbnail of a familiar wireframe box:



Now I remembered: classic ambiguous illusion. Sometimes the shaded panel seemed to be in front, sometimes behind. The perspective flipped back and forth as you watched.

"You or I, we can only see it one way or the other," Pag was saying. "Vamps see it both ways *at once*. Do you have any *idea* what kind of an edge that gives 'em?"

"Not enough of one."

"*Touché*. But hey, not their fault neutral traits get fixed in small populations."

"I don't know if I'd call the Crucifix glitch *neutral*."

"It was at first. How many intersecting right angles do you see in nature?" He waved one dismissive hand. "Anyway, that's not the point. The point is they can do something that's neurologically impossible for us Humans. They can hold *simultaneous multiple worldviews*, Pod-man. They just *see* things we have to work out step-by-step, they don't have to *think* about it. You know, there isn't a single baseline human who could just tell you, just off the top of their heads, every prime number between one and a billion? In the old days, only a few autistics could do shit like that."

"He never uses the past tense," I murmured.

"Huh? Oh, that." Pag nodded. "They never *experience* the past tense. It's just another thread to them. They don't remember

stuff, they *relive* it."

"What, like a post-traumatic flashback?"

"Not so traumatic." He grimaced. "Not for *them*, at least."

"So this is obviously your current hot spot? Vampires?"

"Pod, vampires are the capital-Hot spot for *anyone* with a 'neuro' in their c.v. I'm just doing a couple of histology papers. Pattern-matching receptors, Mexican-hat arrays, reward/irrelevance filters. The eyes, basically."

"Right." I hesitated. "Those kind of throw you."

"No *shit*." Pag nodded knowingly. "That tap lucidum of theirs, that *shine*. Scary." He shook his head, impressed all over again at the recollection.

"You've never met one," I surmised.

"What, in the flesh? I'd give my left ball. Why?"

"It's not the shine. It's the—" I groped for a word that fit—"The *attitude*, maybe."

"Yeah," he said after a bit. "I guess sometimes you've just gotta be there, huh? Which is why I envy you, Pod-man."

"You shouldn't."

"I should. Even if you never meet whoever sent the 'Flies, you're in for one Christly research opportunity with that—Sarasti, is it?"

"Wasted on me. The only neuro in *my* file's under medical history."

He laughed. "Anyway, like I said, I just saw your name in the headlines and I figured, hey, the man's leaving in a couple of months, I should probably stop waiting around for *him* to call."

It had been over two years. "I didn't think I'd get through. I thought you'd shitlisted me."

"Nah. Never." He looked down, though, and fell silent.

"But you should have called her," he said at last.

"I know."

"She was *dying*. You should've—"

"There wasn't time."

He let the lie sit there for a while.

"Anyway," he said at last. "I just wanted to wish you luck." Which wasn't exactly true either.

"Thanks. I appreciate that."

"Kick their alien asses. If aliens have asses."

"There's five of us, Pag. Nine if you count the backups. We're not exactly an army."

"Just an expression, fellow mammal. Bury the hatchet. Damn the torpedoes. Soothe the serpent."

Raise the white flag, I thought.

"I guess you're busy," he said, "I'll—"

"Look, you want to get together? In airspace? I haven't been to QuBit's in a while."

"Love to, Pod. Unfortunately I'm in Mankoya. Splice'n'dice workshop."

"What, you mean *physically*?"

"Cutting-edge research. Old-school habits."

"Too bad."

"Anyway, I'll let you go. Just wanted, you know—"

"Thanks," I said again.

"So, you know. Bye," Robert Paglino told me. Which was, when you got down to it, the reason he'd called.

He wasn't expecting another chance.

Pag blamed me for the way it had ended with Chelsea. Fair enough. I blamed him for the way it began.

He'd gone into neuroeconomics at least partly because his childhood buddy had turned into a pod person before his eyes. I'd ended up in Synthesis for roughly the same reason. Our paths had diverged, and we didn't see each other in the flesh all that often; but two decades after I'd brutalized a handful of children on his behalf, Robert Paglino was still my best and only friend.

"You need to seriously thaw out," he told me, "And I know just the lady to handle the oven mitts."

"That is perhaps the worst use of metaphor in the history of human language," I said.

"Seriously, Pod. She'll be good for you. A, a *counterbalance*—ease you a bit closer to the comfy mean, you know?"

"No, Pag, I don't. What is she, another neuroeconomist?"

"Neuroaestheticist," he said.

"There's still a market for those?" I couldn't imagine how; why pay to tweak your compatibility with some significant other, when significant others themselves were so out of fashion?

"Not much of one," Pag admitted. "Fact is, she's pretty much retired. But she's still got the tools, my man. Very thigmotactic. Likes all her relationships face-to-face and in the flesh."

"I dunno, Pag. Sounds like work."

"Not like *your* work. She's got to be easier than the bleeding composites you front for. She's smart, she's sexy, and she's nicely inside the standard deev except for the personal contact thing. Which is not so much outright perversion as charming fetish. In your case it could even be therapeutic."

"If I wanted therapy I'd see a therapist."

"She does a bit of that too, actually."

"Yeah?" And then, despite myself, "Any good?"

He looked me up and down. "No one's *that* good. That's not what this is. I just figured you two would click. Chelse is one of the few who might not be completely put off by your intimacy issues."

"*Everyone's* got intimacy issues these days, in case you hadn't noticed." He must have; the population had been dropping for decades.

"I was being euphemistic. I meant your aversion to general Human contact."

"Making it euphemistic to call you Human?"

He grinned. "Different deal. We got history."

"No thanks."

"Too late. She's already en route to the appointed place."

"Appoin—you're an asshole, Pag."

"The tightest."

Which was how I found myself intrusively face-to-face in an airspace lounge south of Beth and Bear. The lighting was low

and indirect, creeping from under seats and the edges of tables; the chromatics, this afternoon at least, were defiantly longwave. It was a place where baselines could pretend to see in infrared.

So I pretended for a moment, assessing the woman in the corner booth: gangly and glorious, half-a-dozen ethnicities coexisting peacefully with no single voice dominant. Something glowed on her cheek, a faint emerald staccato against the ambient red shift. Her hair floated in a diffuse ebony cloud about her head; as I neared I caught occasional glints of metal within that nimbus, the threads of a static generator purveying the illusion of weightlessness. In normal light her blood-red skin would doubtless shift down to the fashionable butterscotch of the unrepentant mongrel.

She *was* attractive, but so was everyone in this kind of light; the longer the wavelength, the softer the focus. There's a reason fuckcubbies don't come with fluorescent lights.

You will not fall for this, I told myself.

"Chelsea," she said. Her little finger rested on one of the table's inset trickle-chargers. "Former neuroaestheticist, presently a parasite on the Body Economic thanks to genes and machines on the cutting edge."

The glow on her cheek flapped bright lazy wings: a tattoo, a bioluminescent butterfly.

"Siri," I said. "Freelance synthesist, indentured servant to the genes and machines that turned you into a parasite."

She waved at the empty seat. I took it, assessing the system before me, sizing up the best approach for a fast yet diplomatic disconnect. The set of her shoulders told me she enjoyed lightscapes, and was embarrassed to admit it. Monahan was her favorite artist. She thought herself a natural girl because she'd stayed on chemical libidinals all these years, even though a synaptic edit would have been simpler. She revelled in her own inconsistency: a woman whose professional machinery edited thought itself, yet mistrustful of the dehumanising impact of telephones. Innately affectionate, and innately afraid of unreturned affection, and indomitably unwilling to let any of

that stop her.

She liked what she saw when looked at me. She was a little afraid of that, too.

Chelsea gestured at my side of the table. The touchpads there glowed soft, dissonant sapphire in the bloody light, like a set of splayed fingerprints. "Good dope here. Extra hydroxyl on the ring, or something."

Assembly-line neuropharm doesn't do much for me; it's optimized for people with more meat in their heads. I fingered one of the pads for appearances, and barely felt the tingle.

"So. A Synthesist. Explaining the Incomprehensible to the Indifferent."

I smiled on cue. "More like bridging the gap between the people who make the breakthroughs and the people who take the credit for them."

She smiled back. "So how do you do it? All those optimized frontal lobes and refits—I mean, if they're incomprehensible, how do you comprehend them?"

"It helps to find pretty much everyone else incomprehensible too. Provides experience." There. That should force a bit of distance.

It didn't. She thought I was joking. I could see her lining up to push for more details, to ask questions about what I did, which would lead to questions about *me*, which would lead—

"Tell me what it's like," I said smoothly, "rewiring people's heads for a living."

Chelsea grimaced; the butterfly on her cheek fluttered nervously at the motion, wings brightening. "God, you make it sound like we turn them into zombies or something. They're just tweaks, mainly. Changing taste in music or cuisine, you know, optimizing mate compatibility. It's all completely reversible."

"There aren't drugs for that?"

"Nah. Too much developmental variation between brains; our targeting is *really* fine-scale. But it's not all microsurgery and fried synapses, you know. You'd be surprised how much rewiring can be done noninvasively. You can start all sorts of

cascades just by playing certain sounds in the right order, or showing images with the right balance of geometry and emotion."

"I assume those are new techniques."

"Not really. Rhythm and music hang their hats on the same basic principle. We just turned art into science."

"Yeah, but when?" The recent past, certainly. Sometime within the past twenty years or so—

Her voice grew suddenly quiet. "Robert told me about your operation. Some kind of viral epilepsy, right? Back when you were just a tyke."

I'd never explicitly asked him to keep it a secret. What was the difference anyway? I'd made a full recovery.

Besides, Pag still thought that had happened to someone *else*.

"I don't know your specifics," Chelsea continued gently. "But from the sound of it, noninvasive techniques wouldn't have helped. I'm sure they only did what they had to."

I tried to suppress the thought, and couldn't: *I like this woman*.

I felt something then, a strange, unfamiliar sensation that somehow loosened my vertebrae. The chair felt subtly, indefinably more comfortable at my back.

"Anyway." My silence had thrown her off-stride. "Haven't done it much since the bottom dropped out of the market. But it *did* leave me with a fondness for face-to-face encounters, if you know what I mean."

"Yeah. Pag said you took your sex in the first-person."

She nodded. "I'm very old-school. You okay with that?"

I wasn't certain. I was a virgin in the real world, one of the few things I still had in common with the rest of civilized society. "In principle, I guess. It just seems—a lot of effort for not as much payoff, you know?"

"Don't I." She smiled. "Real fuckbuddies aren't airbrushed. Got all these *needs* and *demands* that you can't edit out. How can you blame anyone for saying *no thanks* to all that, now there's a choice? You gotta wonder how our parents ever stayed together sometimes."

You gotta wonder why they did. I felt myself sinking deeper

into the chair, wondered again at this strange new sensation. Chelsea had said the dopamine was tweaked. That was probably it.

She leaned forward, not coy, not coquettish, not breaking eye contact for an instant in the longwave gloom. I could smell the lemony tang of pheromones and synthetics mingling on her skin. "But there are advantages too, once you learn the moves," she said. "The body's got a long memory. And you *do* realize that there's no trickler under your left finger there, don't you, Siri?"

I looked. My left arm was slightly extended, index finger touching one of the trickle pads; and my right had mirrored the motion while I wasn't watching, its own finger tapping uselessly on blank tabletop.

I pulled it back. "Bit of a bilateral twitch," I admitted. "The body creeps into symmetrical poses when I'm not looking."

I waited for a joke, or at least a raised eyebrow. Chelsea just nodded and resumed her thread. "So if you're game for this, so am I. I've never been entangled with a synthesist before."

"Jargonaut's fine. I'm not proud."

"Don't you just always know just exactly what to say." She cocked her head at me. "So, your name. What's it mean?"

Relaxed. That was it. I felt *relaxed*.

"I don't know. It's just a name."

"Well, it's not good enough. If we're gonna to be swapping spit for any length of time you've gotta get a name that *means* something."

And we were, I realized. Chelsea had decided while I wasn't looking. I could have stopped her right there, told her what a bad idea this was, apologized for any misunderstanding. But then there'd be wounded looks and hurt feelings and guilt because after all, if I wasn't interested why the hell had I even shown up?

She seemed nice. I didn't want to hurt her.

Just for a while, I told myself. *It'll be an experience*.

"I think I'll call you Cygnus," Chelsea said.

"The swan?" I said. A bit precious, but it could have been

worse.

She shook her head. "Black hole. Cygnus X-1."

I furrowed my brow at her, but I knew exactly what she meant: a dark, dense object that sucks up the light and destroys everything in its path.

"Thanks a whole fucking lot. Why?"

"I'm not sure. Something dark about you." She shrugged, and gave me a great toothy grin. "But it's not unattractive. And let me give you a tweak or two, I bet you'd grow right out of it."

Pag admitted afterward, a bit sheepishly, that maybe I should have read that as a warning sign. Live and learn.

LEADERS ARE VISIONARIES WITH A POORLY DEVELOPED SENSE OF FEAR AND NO CONCEPT OF THE ODDS AGAINST THEM.

—ROBERT JARVIK

OUR SCOUT FELL towards orbit, watching Ben. We fell days behind, watching the scout. And that was *all* we did: sit in *Theseus'* belly while the system streamed telemetry to our inlays. Essential, irreplaceable, mission-critical—we might as well have been ballast during that first approach.

We passed Ben's Rayleigh limit. *Theseus* squinted at a meager emission spectrum and saw a rogue halo element from Canis Major—a dismembered remnant of some long-lost galaxy that had drifted into ours and ended up as road kill, uncounted billions of years ago. We were closing on something from outside the Milky Way.

The probe arced down and in, drew close enough for false-color enhance. Ben's surface brightened to a seething parfait of high-contrast bands against a diamond-hard starscape. Something twinkled there, faint sparkles on endless overcast.

"Lightning?" James wondered.

Szpindel shook his head. "Meteorites. Must be a lot of rock in the neighborhood."

"Wrong color," Sarasti said. He was not physically among us—he was back in his tent, hardlined into the Captain—but ConSensus put him anywhere on board he wanted to be.

Morphometrics scrolled across my inlays: mass, diameter, mean density. Ben's day lasted seven hours twelve minutes. Diffuse but massive accretion belt circling the equator, more torus than ring, extending almost a half-million kilometers from the cloud-tops: the pulverized corpses of moons perhaps, ground down to leftovers.

"Meteorites." Szpindel grinned. "Told ya."

He seemed to be right; increasing proximity smeared many of those pinpoint sparkles into bright ephemeral hyphens, scratching the atmosphere. Closer to the poles, cloud bands flickered with dim, intermittent flashes of electricity.

Weak radio emission peaks at 31 and 400m. Outer atmosphere heavy with methane and ammonia; lithium, water, carbon monoxide in abundance. Ammonia hydrogen sulfide, alkali halide mixing locally in those torn swirling clouds. Neutral alkalis in the upper layers. By now even *Theseus* could pick those things out from a distance, but our scout was close enough to see filigree. It no longer saw a disk. It gazed down at a dark convex wall in seething layers of red and brown, saw faint stains of anthracene and pyrene.

One of a myriad meteorite contrails scorched Ben's face directly ahead; for a moment I thought I could even see the tiny dark speck at its core, but sudden static scratched the feed. Bates cursed softly. The image blurred, then steadied as the probe pitched its voice higher up the spectrum. Unable to make itself heard above the longwave din, now it spoke down a laser.

And still it stuttered. Keeping it aligned across a million fluctuating kilometers should have posed no problem at all; our respective trajectories were known parabolas, our relative positions infinitely predictable at any time t . But the meteorite's contrail jumped and skittered on the feed, as if the beam were being repeatedly, infinitesimally knocked out of alignment.

Incandescent gas blurred its details; I doubted that even a rock-steady image would have offered any sharp edges for a human eye to hold on to. Still. There was something *wrong* about it somehow, something about the tiny black dot at the core of that fading brightness. Something that some primitive part of my mind refused to accept as *natural*—

The image lurched again, and flashed to black, and didn't return.

"Probe's fried," Bates reported. "Spike there at the end. Like it hit a Parker Spiral, but with a *really* tight wind."

I didn't need to call up subtitles. It was obvious in the set of her face, the sudden creases between her eyebrows: she was talking about a magnetic field.

"It's—" she began, and stopped as a number popped up in ConSensus: *11.2 Tesla*.

"*Holy shit*," Szpindel whispered. "Is that right?"

Sarasti clicked from the back of his throat and the back of the ship. A moment later he served up an instant replay, those last few seconds of telemetry zoomed and smoothed and contrast-enhanced from visible light down to deep infrared. There was that same dark shard cauled in flame, there was the contrail burning in its wake. Now it dimmed as the object skipped off the denser atmosphere beneath and regained altitude. Within moments the heat trace had faded entirely. The thing that had burned at its center rose back into space, a fading ember. A great conic scoop at its front end gaped like a mouth. Stubby fins disfigured an ovoid abdomen.

Ben lurched and went out all over again.

"Meteorites," Bates said dryly.

The thing had left me with no sense of scale. It could have been an insect or an asteroid. "How big?" I whispered, a split-second before the answer appeared on my inlays:

Four hundred meters along the major axis.

Ben was safely distant in our sights once more, a dark dim disk centered in *Theseus's* forward viewfinder. But I remembered the close-up: a twinkling orb of black-hearted fires; a face gashed and pockmarked, endlessly wounded,

endlessly healing.

There'd been *thousands* of the things.

Theseus shivered along her length. It was just a pulse of decelerating thrust; but for that one moment, I imagined I knew how she felt.

We headed in and hedged our bets.

Theseus weaned herself with a ninety-eight-second burn, edged us into some vast arc that might, with a little effort, turn into an orbit—or into a quick discreet flyby if the neighborhood turned out to be a little too rough. The Icarus stream fell invisibly to port, its unswerving energy lost to space-time. Our city-sized, molecule-thick parasol wound down and packed itself away until the next time the ship got thirsty. Antimatter stockpiles began dropping immediately; this time we were alive to watch it happen. The dip was infinitesimal, but there was something disquieting about the sudden appearance of that minus sign on the display.

We could have retained the apron strings, left a buoy behind in the telematter stream to bounce energy down the well after us. Susan James wondered why we hadn't.

"Too risky," Sarasti said, without elaboration.

Szpendel leaned in James' direction. "Why give 'em something *else* to shoot at, eh?"

We sent more probes ahead, though, spat them out hard and fast and too fuel-constrained for anything but flyby and self-destruct. They couldn't take their eyes off the machines swinging around Big Ben. *Theseus* stared her own unblinking stare, more distant though more acute. But if those high divers even knew we were out there, they ignored us completely. We tracked them across the closing distance, watched them swoop and loop through a million parabolas at a million angles. We never saw them collide—not with each other, not with the cauldron of rock tumbling around Ben's equator. Every perigee

dipped briefly into atmosphere; there they burned, and slowed, and accelerated back into space, their anterior scoops glowing with residual heat.

Bates grabbed a ConSensus image, drew highlights and a conclusion around the front end: "Scramjet."

We tracked nearly four hundred thousand in less than two days. That appeared to be most of them; new sightings leveled off afterwards, the cumulative curve flattening towards some theoretical asymptote. Most of the orbits were close and fast, but Sarasti projected a frequency distribution extending almost back to Pluto. We might stay out here for years, and still catch the occasional new shovelnose returning from its extended foray into the void.

"The faster ones are pulling over fifty gees on the hairpin turn," Szpindel pointed out. "Meat couldn't handle that. I say they're unmanned."

"Meat's reinforceable," Sarasti said.

"If it's got *that* much scaffolding you might as well stop splitting hairs and call it a machine anyway."

Surface morphometrics were absolutely uniform. Four hundred thousand divers, every one identical. If there was an alpha male calling the shots among the herd, it couldn't be distinguished on sight.

One night—as such things were measured on board—I followed a soft squeal of tortured electronics up to the observation blister. Szpindel floated there, watching the skimmers. He'd closed the clamshells, blocked off the stars and built a little analytical nest in their place. Graphs and windows spilled across the inside of the dome as though the virtual space in Szpindel's head was insufficient to contain them. Tactical graphics lit him from all sides, turned his body into a bright patchwork of flickering tattoos.

The Illustrated Man. "Mind if I come in?" I asked.

He grunted: *Yeah, but not enough to push it.*

Inside the dome, the sound of heavy rainfall hissed and spat behind the screeching that had led me here. "What is that?"

"Ben's magnetosphere." He didn't look back. "Nice, eh?"

Synthesists don't have opinions on the job; it keeps observer effects to a minimum. This time I permitted myself a small breach. "The static's nice. I could do without the screeching."

"Are you kidding? That's the music of the spheres, commissar. It's *beautiful*. Like old jazz."

"I never got the hang of that either."

He shrugged and squelched the upper register, left the rain pattering around us. His jiggling eyes fixed on some arcane graphic. "Want a scoop for your notes?"

"Sure."

"There you go." Light reflected off his feedback glove, iridescent like the wing of a dragonfly as he pointed: an absorption spectrum, a looped time-series. Bright peaks surged and subsided, surged and subsided across a fifteen-second timeframe.

Subtitles only gave me wavelengths and Angstroms. "What is it?"

"Diver farts. Those bastards are dumping complex organics into the atmosphere."

"How complex?"

"Hard to tell, so far. Faint traces, and they dissipate like *that*. But sugars and aminos at least. Maybe proteins. Maybe more."

"Maybe life? Microbes?" An alien terraforming project...

"Depends on how you define *life*, eh?" Szpindel said. "Not even *Deinococcus* would last long down there. But it's a big atmosphere. They better not be in any hurry if they're reworking the whole thing by direct inoculation."

If they were, the job would go a lot faster with self-replicating inoculates. "Sounds like life to me."

"Sounds like agricultural aerosols, is what it sounds like. Those fuckers are turning the whole damn gas ball into a rice paddy bigger than Jupiter." He gave me a scary grin. "Something's got a *beeeg* appetite, hmm? You gotta wonder if we aren't gonna be a teeny bit outnumbered."

Szpindel's findings were front and center at our next get-together.

The vampire summed it up for us, visual aids dancing on the table: "Von Neumann self-replicating r-selector. Seed washes up and sprouts skimmers, skimmers harvest raw materials from the accretion belt. Some perturbations in those orbits; belt's still unsettled."

"Haven't seen any of the herd giving birth," Szpindel remarked. "Any sign of a factory?"

Sarasti shook his head. "Discarded, maybe. Decompiled. Or the herd stops breeding at optimal N."

"These are only the bulldozers," Bates pointed out. "There'll be tenants."

"A *lot* of 'em, eh?" Szpindel added. "Outnumber us by orders of mag."

James: "But they might not show up for centuries."

Sarasti clicked. "Do these skimmers build Fireflies? Burns-Caulfield?"

It was a rhetorical question. Szpindel answered anyway: "Don't see how."

"Something else does, then. Something already local."

Nobody spoke for a moment. James' topology shifted and shuffled in the silence; when she opened her mouth again, someone indefinably *younger* was on top.

"Their habitat isn't anything like ours, if they're building a home way out here. That's hopeful."

Michelle. The synesthete.

"Proteins." Sarasti's eyes were unreadable behind the visor. *Comparable biochemistries. They might eat us.*

"Whoever these beings are, they don't even live in *sunlight*. No territorial overlap, no resource overlap, no basis for conflict. There's no reason we shouldn't get along just fine."

"On the other hand," Szpindel said, "Technology implies belligerence."

Michelle snorted softly. "According to a coterie of theoretical historians who've never actually met an alien, yes. Maybe now we get to prove them wrong." And in the next instant she was

just *gone*, her affect scattered like leaves in a dust-devil, and Susan James was back in her place saying:

"Why don't we just *ask* them?"

"Ask?" Bates said.

"There are four hundred thousand machines out there. How do we know they can't talk?"

"We'd have heard.," Szpindel said. "They're drones."

"Can't hurt to ping them, just to make sure."

"There's no reason they should talk even if they *are* smart. Language and intelligence aren't all that strongly correlated even on Ear—"

James rolled her eyes. "Why not *try*, at least? It's what we're here for. It's what *I'm* here for. Just *send a bloody signal*."

After a moment Bates picked up the ball. "Bad game theory, Suze."

"Game theory." She made it sound like a curse.

"Tit-for-tat's the best strategy. They pinged us, we pinged back. Ball's in their court now; we send another signal, we may give away too much."

"I know the rules, Amanda. They say if the other party never takes the initiative again, we ignore each other for the rest of the mission because game theory says you don't want to look *needy*."

"The rule only applies when you're going up against an unknown player, " the Major explained. "We'll have more options the more we learn."

James sighed. "It's just—you all seem to be going into this *assuming* they'll be hostile. As if a simple hailing signal is going to bring them down on us."

Bates shrugged. "It only makes sense to be cautious. I may be a jarhead but I'm not eager to piss off *anything* that hops between stars and terraforms superJovians for a living. I don't have to remind anyone here that *Theseus* is no warship."

She'd said *anyone*; she'd meant *Sarasti*. And Sarasti, focused on his own horizon, didn't answer. Not out loud, at least; but his surfaces spoke in a different tongue entirely.

Not yet, they said.

Bates was right, by the way. *Theseus* was officially tricked out for exploration, not combat. No doubt our masters would have preferred to load her up with nukes and particle cannons as well as her scientific payload, but not even a telemattered fuel stream can change the laws of inertia. A weaponized prototype would have taken longer to build; a more massive one, laden with heavy artillery, would take longer to accelerate. Time, our masters had decided, was of greater essence than armament. In a pinch our fabrication facilities could build most anything we needed, given time. It might take a while to build a particle-beam cannon from scratch, and we might have to scavenge a local asteroid for the raw material, but we could do it. Assuming our enemies would be willing to wait, in the interests of fair play.

But what were the odds that even our best weapons would prove effective against the intelligence that had pulled off the Firefall? If the unknown was hostile, we were probably doomed no matter what we did. The Unknown *was* technologically advanced—and there were some who claimed that that made them hostile by definition. *Technology Implies Belligerence*, they said.

I suppose I should explain that, now that it's completely irrelevant. You've probably forgotten after all this time.

Once there were three tribes. The Optimists, whose patron saints were Drake and Sagan, believed in a universe crawling with gentle intelligence—spiritual brethren vaster and more enlightened than we, a great galactic siblinghood into whose ranks we would someday ascend. *Surely*, said the Optimists, *space travel implies enlightenment, for it requires the control of great destructive energies. Any race which can't rise above its own brutal instincts will wipe itself out long before it learns to bridge the interstellar gulf.*

Across from the Optimists sat the Pessimists, who genuflected before graven images of Saint Fermi and a host of lesser

lightweights. The Pessimists envisioned a lonely universe full of dead rocks and prokaryotic slime. *The odds are just too low*, they insisted. *Too many rogues, too much radiation, too much eccentricity in too many orbits. It is a surpassing miracle that even one Earth exists; to hope for many is to abandon reason and embrace religious mania. After all, the universe is fourteen billion years old: if the galaxy were alive with intelligence, wouldn't it be here by now?*

Equidistant to the other two tribes sat the Historians. They didn't have too many thoughts on the probable prevalence of intelligent, spacefaring extraterrestrials— *but if there are any*, they said, *they're not just going to be smart. They're going to be mean.*

It might seem almost too obvious a conclusion. What is Human history, if not an ongoing succession of greater technologies grinding lesser ones beneath their boots? But the subject wasn't merely *Human* history, or the unfair advantage that tools gave to any given side; the oppressed snatch up advanced weaponry as readily as the oppressor, given half a chance. No, the real issue was how those tools got there in the first place. The real issue was what tools are *for*.

To the Historians, tools existed for only one reason: to force the universe into unnatural shapes. They treated nature as an enemy, they were by definition a rebellion against the way things were. Technology is a stunted thing in benign environments, it never thrived in any culture gripped by belief in natural harmony. Why invent fusion reactors if your climate is comfortable, if your food is abundant? Why build fortresses if you have no enemies? Why force change upon a world which poses no threat?

Human civilization had a lot of branches, not so long ago. Even into the twenty-first century, a few isolated tribes had barely developed stone tools. Some settled down with agriculture. Others weren't content until they had ended nature itself, still others until they'd built cities in space.

We all rested eventually, though. Each new technology trampled lesser ones, climbed to some complacent asymptote,

and stopped—until my own mother packed herself away like a larva in honeycomb, softened by machinery, robbed of incentive by her own contentment.

But history never said that everyone had to stop where we did. It only suggested that those who *had* stopped no longer struggled for existence. There could be other, more hellish worlds where the best Human technology would crumble, where the environment was still the enemy, where the only survivors were those who fought back with sharper tools and stronger empires. The threats contained in those environments would not be simple ones. Harsh weather and natural disasters either kill you or they don't, and once conquered—or adapted to—they lose their relevance. No, the only environmental factors that continued to matter were those that fought back, that countered new strategies with newer ones, that forced their enemies to scale ever-greater heights just to stay alive. Ultimately, the only enemy that mattered was an *intelligent* one.

And if the best toys do end up in the hands of those who've never forgotten that life itself is an act of war against intelligent opponents, what does that say about a race whose machines travel between the stars?

The argument was straightforward enough. It might even have been enough to carry the Historians to victory—if such debates were ever settled on the basis of logic, and if a bored population hadn't already awarded the game to Fermi on points. But the Historian paradigm was just too ugly, too *Darwinian*, for most people, and besides, no one really cared any more. Not even the Cassidy Survey's late-breaking discoveries changed much. So what if some dirtball at Ursae Majoris Eridani had an oxygen atmosphere? It was forty-three lightyears away, and it wasn't talking; and if you wanted flying chandeliers and alien messiahs, you could build them to order in Heaven. If you wanted testosterone and target practice you could choose an afterlife chock-full of nasty alien monsters with really bad aim. If the mere thought of an alien intelligence threatened your worldview, you could explore a virtual galaxy of empty real estate, ripe and waiting for any God-fearing

earthly pilgrims who chanced by.

It was all there, just the other side of a fifteen-minute splice job and a cervical socket. Why endure the cramped and smelly confines of real-life space travel to go visit pond scum on Europa?

And so, inevitably, a fourth Tribe arose, a Heavenly host that triumphed over all: the Tribe that Just Didn't Give A Shit. They didn't know *what* to do when the Fireflies showed up.

So they sent us, and—in belated honor of the Historian mantra—they sent along a warrior, just in case. It was doubtful in the extreme that any child of Earth would be a match for a race with interstellar technology, should they prove unfriendly. Still, I could tell that Bates' presence was a comfort, to the Human members of the crew at least. If you have to go up unarmed against an angry T-rex with a four-digit IQ, it can't hurt to have a trained combat specialist at your side.

At the very least, she might be able to fashion a pointy stick from the branch of some convenient tree.

"I swear, if the aliens end up eating the lot of us, we'll have the Church of Game Theory to thank for it," Sascha said.

She was grabbing a brick of couscous from the galley. I was there for the caffeine. We were more or less alone; the rest of the crew was strewn from dome to Fab.

"Linguists don't use it?" I knew some that did.

"We don't." *And the others are hacks.* "Thing about game theory is, it assumes rational self-interest among the players. And people just aren't *rational*."

"It used to assume that," I allowed. "These days they factor in the social neurology."

"*Human* social neurology." She bit a corner off her brick, spoke around a mouthful of semolina. "That's what game theory's good for. Rational players, or human ones. And let me take a wild stab here and wonder if either of those is gonna

apply to *that*." She waved her hand at some archetypal alien lurking past the bulkhead.

"It's got its limitations," I admitted. "I guess you use the tools you can lay your hands on."

Sascha snorted. "So if you couldn't get your hands on a proper set of blueprints, you'd base your dream home on a book of dirty limericks."

"Maybe not." And then, a bit defensive in spite of myself, I added, "I've found it useful, though. In areas you might not expect it to be."

"Yeah? Name one."

"Birthdays," I said, and immediately wished I hadn't.

Sascha stopped chewing. Something behind her eyes flickered, almost *strobed*, as if her other selves were pricking up their ears.

"Go on," she said, and I could feel the whole Gang listening in.

"It's nothing, really. Just an example."

"So. Tell us." Sascha cocked James' head at me.

I shrugged. No point making a big thing out of it. "Well, according to game theory, you should never tell anyone when your birthday is."

"I don't follow."

"It's a lose-lose proposition. There's no winning strategy."

"What do you mean, strategy? It's a *birthday*."

Chelsea had said exactly the same thing when I'd tried to explain it to her. *Look, I'd said, say you tell everyone when it is and nothing happens. It's kind of a slap in the face.*

Or suppose they throw you a party, Chelsea had replied.

Then you don't know whether they're doing it sincerely, or if your earlier interaction just guilted them into observing an occasion they'd rather have ignored. But if you don't tell anyone, and nobody commemorates the event, there's no reason to feel badly because after all, nobody knew. And if someone does buy you a drink then you know it's sincere because nobody would go to all the trouble of finding out when your birthday is— and then celebrating it—if they didn't honestly like you.

Of course, the Gang was more up to speed on such things. I didn't have to explain it verbally: I could just grab a piece of ConSensus and plot out the payoff matrix, *Tell/Don't Tell* along the columns, *Celebrated/Not Celebrated* along the rows, the unassailable black-and-white logic of cost and benefit in the squares themselves. The math was irrefutable: the one winning strategy was concealment. Only fools revealed their birthdays.

Sascha looked at me. "You ever show this to anyone else?"

"Sure. My girlfriend."

Her eyebrows lifted. "*You* had a girlfriend? A real one?"

I nodded. "Once."

"I mean *after* you showed this to her."

"Well, yes."

"Uh huh." Her eyes wandered back to the payoff matrix. "Just curious, Siri. How did she react?"

"She didn't, really. Not at first. Then—well, she laughed."

"Better woman than me." Sascha shook her head. "I'd have dumped you on the spot."

My nightly constitutional up the spine: glorious dreamy flight along a single degree of freedom. I sailed through hatches and corridors, threw my arms wide and spun in the gentle cyclonic breezes of the drum. Bates ran circles around me, bouncing her ball against bins and bulkheads, stretching to field each curving rebound in the torqued pseudograv. The toy ricocheted off a stairwell and out of reach as I passed; the major's curses followed me through the needle's eye from crypt to bridge.

I braked just short of the dome, stopped by the sound of quiet voices from ahead.

"Of *course* they're beautiful," Szpindel murmured. "They're *stars*."

"And I'm guessing I'm not your first choice to share the view," James said.

"You're a close second. But I've got a date with Meesh."

"She never mentioned it."

"She doesn't tell you everything. Ask her."

"Hey, *this* body's taking its antilibs. Even if yours isn't."

"Mind out of the gutter, Suze. Eros is only one kind of love, eh? Ancient Greeks recognized four."

"Riiight." Definitely not Susan, not any more. "Figures you'd take your lead from a bunch of sodomites."

"*Fuck*, Sascha. All I'm asking is a few minutes alone with Meesh before the whip starts cracking again..."

"My body too, Ike. You wanna pull your eyes over *my* wool?"

"I just want to talk, eh? *Alone*. That too much to ask?"

I heard Sascha take a breath.

I heard Michelle let it out.

"Sorry, kid. You know the Gang."

"Thank *God*. It's like some group inspection whenever I come looking for face time."

"I guess you're lucky they like you, then."

"I still say you ought to stage a coup."

"You could always move in with us."

I heard the rustle of bodies in gentle contact. "How are you?" Szpindel asked. "You okay?"

"Pretty good. I think I'm finally used to being alive again. You?"

"Hey, I'm a spaz no matter how long I've been dead."

"You get the job done."

"Why, *merci*. I try."

A small silence. *Theseus* hummed quietly to herself.

"Mom was right," Michelle said. "They *are* beautiful."

"What do you see, when you look at them?" And then, catching himself: "I mean—"

"They're—prickly," Michelle told him. "When I turn my head it's like bands of very fine needles rolling across my skin in waves. But it doesn't hurt at all. It just tingles. It's almost electric. It's nice."

"Wish I could feel it that way."

"You've got the interface. Just patch a camera into your parietal lobe instead of your visual cortex."

"That'd just tell me how a *machine* feels vision, eh? Still wouldn't know how *you* do."

"Isaac Szpindel. You're a romantic."

"Nah."

"You don't *want* to know. You want to keep it mysterious."

"Already got more than enough *mystery* to deal with out here, in case you hadn't noticed."

"Yeah, but we can't *do* anything about that."

"That'll change. We'll be working our asses off in no time."

"You think?"

"Count on it," Szpindel said. "So far we've just been peeking from a distance, eh? Bet all kinds of interesting stuff happens when we get in there and start poking with a stick."

"Maybe for you. There's got to be a biological *somewhere* in the mix, with all those organics."

"Damn right. And you'll be talking to 'em while I'm giving them their physicals."

"Maybe not. I mean, Mom would never admit it in a million years but you had a point about language. When you get right down to it, it's a workaround. Like trying to describe dreams with smoke signals. It's noble, it's maybe the most noble thing a body can do but you can't turn a sunset into a string of grunts without losing something. It's *limiting*. Maybe whatever's out here doesn't even use it."

"Bet they do, though."

"Since when? You're the one who's always pointing out how *inefficient* language is."

"Only when I'm trying to get under your skin. Your pants—whole other thing." He laughed at his own joke. "Seriously, what are they gonna to use instead, telepathy? I say you'll be up to your elbows in hieroglyphics before you know it. And what's more, you'll decode 'em in record time."

"You're sweet, but I wonder. Half the time I can't even decode *Jukka*." Michelle fell silent a moment. "He actually kind of throws me sometimes."

"You and seven billion others."

"Yeah. I know it's silly, but when he's not around there's a

part of me that can't stop wondering where he's hiding. And when he's right there in front of me, I feel like *I* should be hiding."

"Not his fault he creeps us out."

"I know. But it's hardly a big morale booster. What genius came up with the idea of putting a vampire in charge?"

"Where else you going to put them, eh? You want to be the one giving orders to *him*?"

"And it's not just the way he moves. It's the way he *talks*. It's just *wrong*."

"You know he—"

"I'm not talking about the present-tense thing, or all the glottals. He—well, you know how he talks. He's *terse*."

"It's efficient."

"It's *artificial*, Isaac. He's smarter than all of us put together, but sometimes he talks like he's got a fifty-word vocabulary." A soft snort. "It's not like it'd kill him to use an adverb once in a while."

"Ah. But you say that because you're a linguist, and you can't see why anyone wouldn't want to wallow in the sheer beauty of *language*." Szpindel *harrumphed* with mock pomposity. "Now me, I'm a biologist, so it makes perfect sense."

"Really. Then explain it to me, oh wise and powerful mutilator of frogs."

"Simple. Bloodsucker's a transient, not a resident."

"What are—oh, those are killer whales, right? Whistle dialects."

"I said forget the *language*. Think about the lifestyle. Residents are fish-eaters, eh? They hang out in big groups, don't move around much, talk all the time." I heard a whisper of motion, imagined Szpindel leaning in and laying a hand on Michelle's arm. I imagined the sensors in his gloves telling him what she felt like. "Transients, now—they eat *mammals*. Seals, sea lions, *smart* prey. Smart enough to take cover when they hear a fluke slap or a click train. So transients are *sneaky*, eh? Hunt in small groups, range all over the place, keep their mouths shut so nobody hears 'em coming."

"And Jukka's a transient."

"Man's instincts tell him to keep quiet around prey. Every time he opens his mouth, every time he lets us see him, he's fighting his own brain stem. Maybe we shouldn't be too harsh on the ol' guy just because he's not the world's best motivational speaker, eh?"

"He's fighting the urge to eat us every time we have a briefing? That's reassuring."

Szpindel chuckled. "It's probably not that bad. I guess even killer whales let their guard down after making a kill. Why sneak around on a full stomach, eh?"

"So he's *not* fighting his brain stem. He just isn't hungry."

"Probably a little of both. Brain stem never really goes away, you know. But I'll tell you one thing." Some of the playfulness ebbed from Szpindel's voice. "I've got no problem if Sarasti wants to run the occasional briefing from his quarters. But the moment we stop seeing him altogether? That's when you start watching your back."

Looking back, I can finally admit it: I envied Szpindel his way with the ladies. Spliced and diced, a gangly mass of tics and jitters that could barely feel his own skin, somehow he managed to be—

Charming. That's the word. Charming.

As a social necessity it was all but obsolete, fading into irrelevance along with two-party nonvirtual sex pairing. But even I'd tried one of those; and it would have been nice to have had Szpindel's self-deprecating skill set to call on.

Especially when everything with Chelsea started falling apart.

I had my own style, of course. I tried to be charming in my own peculiar way. Once, after one too many fights about *honesty* and *emotional manipulation*, I'd started to think maybe a touch of whimsy might smooth things over. I had come to suspect that Chelsea just didn't understand sexual politics. Sure

she'd edited brains for a living, but maybe she'd just memorized all that circuitry without giving any thought to how it had arisen in the first place, to the ultimate rules of natural selection that had shaped it. Maybe she honestly didn't know that we were evolutionary enemies, that *all* relationships were doomed to failure. If I could slip that insight into her head— if I could *charm* my way past her defenses— maybe we'd be able to hold things together.

So I thought about it, and I came up with the perfect way to raise her awareness. I wrote her a bedtime story, a disarming blend of humor and affection, and I called it

The Book of Oogenesis

In the beginning were the gametes. And though there was sex, lo, there was no gender, and life was in balance.

And God said, "Let there be Sperm": and some seeds did shrivel in size and grow cheap to make, and they did flood the market.

And God said, "Let there be Eggs": and other seeds were afflicted by a plague of Sperm. And yea, few of them bore fruit, for Sperm brought no food for the zygote, and only the largest Eggs could make up the shortfall. And these grew yet larger in the fullness of time.

And God put the Eggs into a womb, and said, "Wait here: for thy bulk has made thee unwieldy, and Sperm must seek thee out in thy chambers. Henceforth shalt thou be fertilized internally." And it was so.

And God said to the gametes, "The fruit of thy fusion may abide in any place and take any shape. It may breathe air or water or the sulphurous muck of hydrothermal vents. But do not forget my one commandment unto you, which has not changed from the beginning of time: spread thy genes."

And thus did Sperm and Egg go into the world. And Sperm said, "I am cheap and plentiful, and if sowed abundantly I will surely fulfill God's plan. I shall forever seek out new mates and

then abandon them when they are with child, for there are many wombs and little time."

But Egg said, "Lo, the burden of procreation weighs heavily upon me. I must carry flesh that is but half mine, gestate and feed it even when it leaves my chamber" (for by now many of Egg's bodies were warm of blood, and furry besides). "I can have but few children, and must devote myself to those, and protect them at every turn. And I will make Sperm help me, for he got me into this. And though he doth struggle at my side, I shall not let him stray, nor lie with my competitors."

And Sperm liked this not.

And God smiled, for Its commandment had put Sperm and Egg at war with each other, even unto the day they made themselves obsolete.

I brought her flowers one dusky Tuesday evening when the light was perfect. I pointed out the irony of that romantic old tradition—the severed genitalia of another species, offered as a precopulatory bribe—and then I recited my story just as we were about to fuck.

To this day, I still don't know what went wrong.

THE GLASS CEILING IS IN YOU. THE GLASS CEILING IS
CONSCIENCE.

—JACOB HOLTZBRINCK, *THE KEYS TO THE PLANET*

THERE WERE STORIES, before we left Earth, of a fourth wave: a fleet of deep-space dreadnoughts running silent in our wake, should the cannon fodder up front run into something nasty. Or, if the aliens were friendly, an ambassadorial frigate full of politicians and CEOs ready to elbow their way to the front of the line. Never mind that Earth had no deep-space dreadnoughts or ambassadorial spaceships; *Theseus* hadn't

existed either, before Firefall. Nobody had told us of any such such contingent, but you never show the Big Picture to your front line. The less they know, the less they can betray.

I still don't know if the fourth wave ever existed. I never saw any evidence of one, for whatever that's worth. We might have left them floundering back at Burns-Caulfield. Or maybe they followed us all the way to Big Ben, crept just close enough to see what we were up against, and turned tail before things got ugly.

I wonder if that's what happened. I wonder if they made it back home.

I look back now, and hope not.

A giant marshmallow kicked *Theseus* in the side. *Down* swung like a pendulum. Across the drum Szpindel yelped as if scalded; in the galley, cracking a bulb of hot coffee, I nearly *was*.

This is it, I thought. We got too close. They're hitting back.

"What the—"

A flicker on the party line as Bates linked from the bridge. "Main drive just kicked in. We're changing course."

"To what? Where? Whose orders?"

"Mine," Sarasti said, appearing above us.

Nobody spoke. Drifting into the drum through the stern hatchway: the sound of something *grinding*. I pinged *Theseus'* resource-allocation stack. Fabrication was retooling itself for the mass production of doped ceramics.

Radiation shielding. Solid stuff, bulky and primitive, not the controlled magnetic fields we usually relied on.

The Gang emerged sleepy-eyed from their tent, Sascha grumbling, "What the *fuck*?"

"Watch." Sarasti took hold of ConSensus and shook it.

It was a blizzard, not a briefing: gravity wells and orbital trajectories, shear-stress simulations in thunderheads of ammonium and hydrogen, stereoscopic planetsapes buried

under filters ranging from gamma to radio. I saw breakpoints and saddlepoints and unstable equilibria. I saw fold catastrophes plotted in five dimensions. My augments strained to rotate the information; my meaty half-brain struggled to understand the bottom line.

Something was hiding down there, in plain sight.

Ben's accretion belt still wasn't behaving. Its delinquency wasn't obvious; Sarasti hadn't had to plot every pebble and mountain and planetesimal to find the pattern, but he'd come close. And neither he nor the conjoined intelligence he shared with the Captain had been able to explain those trajectories as the mere aftermath of some past disturbance. The dust wasn't just *settling*; some of it marched downhill to the beat of something that even now reached out from the cloud-tops and pulled debris from orbit.

Not all that debris seemed to hit. Ben's equatorial regions flickered constantly with the light of meteorite impacts—much fainter than the bright wakes of the skimmers, and gone in the wink of an eye—but those frequency distributions didn't quite account for all the rocks that had fallen. It was almost as though, every now and then, some piece of incoming detritus simply vanished into a parallel universe.

Or got caught by something in *this* one. Something that circled Ben's equator every forty hours, almost low enough to graze the atmosphere. Something that didn't show up in visible light, or infrared, or radar. Something that might have remained pure hypothesis if a skimmer hadn't burned an incandescent trail across the atmosphere *behind* it when *Theseus* happened to be watching.

Sarasti threw that one dead center: a bright contrail streaking diagonally across Ben's perpetual nightscape, stuttering partway a degree or two to the left, stuttering back just before it passed from sight. Freeze-frame showed a beam of light frozen solid, a segment snapped from its midsection and jiggled just a hair out of alignment.

A segment nine kilometers long.

"It's *cloaked*," Sascha said, impressed.

"Not very well." Bates emerged from the forward hatch and sailed spinward. "Pretty obvious refractory artefact." She caught stairs halfway to the deck, used the torque of spin-against-spin to flip upright and plant her feet on the steps. "Why didn't we catch that before?"

"No backlight," Szpindel suggested.

"It's not just the contrail. Look at the clouds." Sure enough, Ben's cloudy backdrop showed the same subtle dislocation. Bates stepped onto the deck and headed for the conference table. "We should've seen this earlier."

"The other probes see no such artefact," Sarasti said. "*This* probe approaches from a wider angle. Twenty-seven degrees."

"Wider angle to what?" Sascha said.

"To the line," Bates murmured. "Between us and them."

It was all there on tactical: *Theseus* fell inwards along an obvious arc, but the probes we'd dispatched hadn't dicked around with Hohmann transfers: they'd burned straight down, their courses barely bending, all within a few degrees of the theoretical line connecting Ben to *Theseus*.

Except this one. This one had come in wide, and seen the trickery.

"The further from our bearing, the more obvious the discontinuity," Sarasti intoned. "Think it's clearly visible on any approach perpendicular to ours."

"So we're in a blind spot? We see it if we change course?"

Bates shook her head. "The blind spot's *moving*, Sascha. It's—"

"*Tracking* us." Sascha sucked breath between her teeth. "*Motherfucker*."

Szpindel twitched. "So what is it? Our skimmer factory?"

The freeze-frame's pixels began to *crawl*. Something emerged, granular and indistinct, from the turbulent swirls and curlicues of Ben's atmosphere. There were curves, and spikes, and no smooth edges; I couldn't tell how much of the shape was real, and how much a fractal intrusion of underlying cloudscape. But the overall outline was that of a torus, or perhaps a collection of smaller jagged things piled together in a rough ring; and it was *big*. Those nine clicks of displaced contrail had merely

grazed the perimeter, cut across an arc of forty or fifty degrees. This thing hiding in the shadow of ten Jupiters was almost thirty kilometers from side to side.

Sometime during Sarasti's executive summary we'd stopped accelerating. *Down* was back where it belonged. We weren't, though. Our hesitant maybe-maybe-not approach was a thing of the past: we vectored straight in now, and damn the torpedoes.

"Er, that's thirty clicks across," Sascha pointed out. "And it's *invisible*. Shouldn't we maybe be a little *more* cautious now?"

Szpindel shrugged. "We could second-guess vampires, we wouldn't *need* vampires, eh?"

A new facet bloomed on the feed. Frequency histograms and harmonic spectra erupted from flatline into shifting mountainscapes, a chorus of visible light.

"Modulated laser," Bates reported.

Szpindel looked up. "From *that*?"

Bates nodded. "Right after we blow its cover. Interesting timing."

"Scary timing," Szpindel said. "How'd it *know*?"

"We changed course. We're heading right for it."

The lightscape played on, knocking at the window.

"Whatever it is," Bates said, "it's talking to us."

"Well then," remarked a welcome voice. "By all means let's say hello."

Susan James was back in the driver's seat.

I was the only pure spectator.

They all performed what duties they could. Szpindel ran Sarasti's sketchy silhouette through a series of filters, perchance to squeeze a bit of biology from engineering. Bates compared morphometrics between the cloaked artefact and the skimmers. Sarasti watched us all from overhead and thought vampire thoughts deeper than anything we could aspire to. But it was all just make-work. The Gang of Four was on center stage, under

the capable direction of Susan James.

She grabbed the nearest chair, sat, raised her hands as if cueing an orchestra. Her fingers trembled in mid-air as she played virtual icons; her lips and jaw twitched with subvocal commands. I tapped her feed and saw text accreting around the alien signal:

RORSCHACH TO VESSEL APPROACHING 116°AZ -23°DEC REL. HELLO THESEUS. RORSCHACH TO VESSEL APPROACHING 116°AZ -23°DEC REL. HELLO THESEUS. RORSCHACH TO VESSEL APPROACHI

She'd decoded the damn thing. Already. She was even answering it:

Theseus to Rorschach. Hello Rorschach.

HELLO THESEUS. WELCOME TO THE NEIGHBORHOOD.

She'd had less than three minutes. Or rather, *they'd* had less than three minutes: four fully-conscious hub personalities and a few dozen unconscious semiotic modules, all working in parallel, all exquisitely carved from the same lump of gray matter. I could almost see why someone would do such deliberate violence to their own minds, if it resulted in this kind of performance.

Up to now I had never fully convinced myself that even survival was sufficient cause.

Request permission to approach, the Gang sent. Simple and straightforward: just facts and data, thank you, with as little room as possible for ambiguity and misunderstanding. Fancy sentiments like *we come in peace* could wait. A handshake was not the time for cultural exchange.

YOU SHOULD STAY AWAY. SERIOUSLY. THIS PLACE IS DANGEROUS.

That got some attention. Bates and Szpindel hesitated momentarily in their own headspaces and glanced into James'.

Request information on danger, the gang sent back. Still keeping it concrete.

TOO CLOSE AND DANGEROUS TO YOU. LOW ORBIT
COMPLICATIONS.

Request information on low orbit complications.

LETHAL ENVIRONMENT. ROCKS AND RADS. YOU'RE WELCOME. I
CAN TAKE IT BUT WE'RE LIKE THAT.

*We are aware of the rocks in low orbit. We are equipped to
deal with radiation. Request information on other hazards.*

I dug under the transcript to the channel it fed from. *Theseus* had turned part of the incoming beam into a sound wave, according to the color code. Vocal communication, then. They *spoke*. Waiting behind that icon were the raw sounds of an alien language.

Of course I couldn't resist.

"Anytime between friends, right? Are you here for the celebration?"

English. The voice was human, male. *Old*.

"We are here to explore," replied the Gang, although *their* voice was pure *Theseus*. "Request dialog with agents who sent objects into near-solar space."

"First contact. Sounds like something to celebrate."

I double-checked the source. No, this wasn't a translation; this was the actual unprocessed signal coming from—*Rorschach*, it had called itself. Part of the signal, anyway; there were other elements, nonacoustic ones, encoded in the beam.

I browsed them while James said, "Request information about your celebration": standard ship-to-ship handshaking protocols.

"You're interested." The voice was stronger now, younger.

"Yes."

"You are?"

"Yes," the Gang repeated patiently.

"You are?"

The slightest hesitation. "This is *Theseus*."

"I know that, baseline." In Mandarin, now. "Who are you?"

No obvious change in the harmonics. Somehow, though, the

voice seemed to have acquired an edge.

"This is Susan James. I am a—"

"You wouldn't be happy here, Susan. Fetishistic religious beliefs involved. There are dangerous observances."

James chewed her lip.

"Request clarification. Are we in danger from these observances?"

"You certainly could be."

"Request clarification. Is it the observances that are dangerous, or the low-orbit environment?"

"The environment of the disturbances. You should pay attention, Susan. Inattention connotes indifference," *Rorschach* said.

"Or disrespect," it added after a moment.

We had four hours before Ben got in the way. Four hours of uninterrupted nonstop communication made vastly easier than anyone had expected. It spoke our language, after all. Repeatedly it expressed polite concern for our welfare. And yet, for all its facility with Human speech it told us very little. For four hours it managed to avoid giving a straight answer on any subject beyond the extreme inadvisability of closer contact, and by the time it fell into eclipse we still didn't know why.

Sarasti dropped onto the deck halfway through the exchange, his feet never touching the stairs. He reached out and grabbed a railing to steady himself on landing, and staggered only briefly. If I'd tried that I'd have ended up bouncing along the deck like a pebble in a cement mixer.

He stood still as stone for the rest of the session, face motionless, eyes hidden behind his onyx visor. When *Rorschach's* signal faded in midsentence he assembled us around the Commons table with a gesture.

"It talks," he said.

James nodded. "It doesn't say much, except for asking us to

keep our distance. So far the voice has manifested as adult male, although the apparent age changed a few times."

He'd heard all that. "Structure?"

"The ship-to-ship protocols are perfect. Its vocabulary is far greater than you could derive from standard nav chatter between a few ships, so they've been listening to all our insystem traffic—I'd say for several years at least. On the other hand, the vocabulary *doesn't* have anywhere near the range you'd get by monitoring entertainment multimedea, so they probably arrived after the Broadcast Age."

"How well do they use the vocabulary they have?"

"They're using phrase-structure grammar, long-distance dependencies. FLN recursion, at least four levels deep and I see no reason why it won't go deeper with continued contact. They're not parrots, Jukka. They know the rules. That name, for example—"

"*Rorschach*," Bates murmured, knuckles cracking as she squeezed her pet ball. "Interesting choice."

"I checked the registry. There's an I-CAN freighter called *Rorschach* on the Martian Loop. Whoever we're talking to must regard their own platform the way we'd regard a ship, and picked one of our names to fit."

Szpindel dropped into the chair beside me, fresh from a galley run. A bulb of coffee glistened like gelatin in his hand. "*That* name, out of all the ships in the innersys? Seems way too symbolic for a random choice."

"I don't think it was random. Unusual ship names provoke comment; *Rorschach*'s pilot goes ship-to-ship with some other vessel, the other vessel comes back with *oh Grandma, what an unusual name you have*, *Rorschach* replies with some off-the-cuff comment about nomenclatural origins and it all goes out in the EM. Someone listening to all that chatter not only figures out the name and the thing it applies to, but can get some sense of meaning from the context. Our alien friends probably eavesdropped on half the registry and deduced that *Rorschach* would be a better tag for something unfamiliar than, say, the *SS Jaymie Matthews*."

"Territorial *and* smart." Szpindel grimaced, conjuring a mug from beneath his chair. "Wonderful."

Bates shrugged. "Territorial, maybe. Not necessarily aggressive. In fact, I wonder if they could hurt us even if they wanted to."

"I don't," Szpindel said. "Those skimmers—"

The major waved a dismissive hand. "Big ships turn slowly. If they were setting up to snooker us we'd see it well in advance." She looked around the table. "Look, am I the only one who finds this odd? An interstellar technology that redecorates superJovians and lines up meteoroids like elephants on parade, and they were *hiding*? From *us*?"

"Unless there's someone else out here," James suggested uneasily.

Bates shook her head. "The cloak was directional. It was aimed at us and no one else."

"And even we saw through it," Szpindel added.

"Exactly. So they go to Plan B, which so far amounts to nothing but bluster and vague warnings. I'm just saying, they're not *acting* like giants. *Rorschach*'s behavior feels—improvised. I don't think they expected us."

"Course not. Burns-Caulfield was—"

"I don't think they expected us *yet*."

"Um," Szpindel said, digesting it.

The major ran one hand over her naked scalp. "Why would they expect us to just *give up* after we learned we'd been sniped? Of course we'd look elsewhere. Burns-Caulfield could only have been intended as a delaying action; if I was them, I'd plan on us getting out here eventually. But I think they miscalculated somehow. We got out here sooner than they expected and caught them with their pants down."

Szpindel split the bulb and emptied it into his mug. "Pretty large miscalculation for something so smart, eh?" A hologram bloomed on contact with the steaming liquid, glowing in soft commemoration of the Gaza Glasslands. The scent of plasticised coffee flooded the Commons. "Especially after they'd surveilled us down to the square meter," he added.

"And what did they see? I-CANNs. Solar sails. Ships that take years to reach the Kuiper, and don't have the reserves to go anywhere else afterwards. Telematter didn't exist beyond Boeing's simulators and a half-dozen prototypes back then. Easy to miss. They must've figured one decoy would buy them all the time they needed."

"To do what?" James wondered.

"Whatever it is," Bates said, "We're ringside."

Szpindel raised his mug with an infirm hand and sipped. The coffee trembled in its prison, the surface wobbling and blobbing in the drum's half-hearted gravity. James pursed her lips in faint disapproval. Open-topped containers for liquids were technically *verboden* in variable-gravity environments, even for people without Szpindel's dexterity issues.

"So they're bluffing," Szpindel said at last.

Bates nodded. "That's my guess. *Rorschach's* still under construction. We could be dealing with an automated system of some kind."

"So we can ignore the keep-off-the-grass signs, eh? Walk right in."

"We can afford to bide our time. We can afford to not push it."

"Ah. So even though we could maybe handle it now, you want to wait until it graduates from *covert* to *invulnerable*." Szpindel shuddered, set down his coffee. "Where'd you get your military training again? Sporting Chance Academy?"

Bates ignored the jibe. "The fact that *Rorschach's* still growing may be the best reason to leave it alone for a while. We don't have any idea what the—mature, I guess—what the mature form of this artefact might be. Sure, it hid. Lots of animals take cover from predators without *being* predators, especially young ones. Sure, it's—evasive. Doesn't give us the answers we want. But maybe it doesn't *know* them, did you consider that? How much luck would you have interrogating a Human embryo? Adult could be a whole different animal."

"Adult could put our asses through a meatgrinder."

"So could the *embryo* for all we know." Bates rolled her eyes.

"Jesus, Isaac, *you're* the biologist. I shouldn't have to tell you how many shy reclusive critters pack a punch when they're cornered. Porcupine doesn't want any trouble, but he'll still give you a faceful of quills if you ignore the warning."

Szpindel said nothing. He slid his coffee sideways along the concave tabletop, to the very limit of his reach. The liquid sat there in its mug, a dark circle perfectly parallel to the rim but canted slightly towards us. I even thought I could make out the merest convexity in the surface itself.

Szpindel smiled faintly at the effect.

James cleared her throat. "Not to downplay your concerns, Isaac, but we've hardly exhausted the diplomatic route. And at least it's willing to talk, even if it's not as forthcoming as we'd like."

"Sure it talks," Szpindel said, eyes still on the leaning mug. "Not like us."

"Well, no. There's some—"

"It's not just slippery, it's downright *dyslexic* sometimes, you noticed? And it mixes up its pronouns."

"Given that it picked up the language entirely via passive eavesdropping, it's remarkably fluent. In fact, from what I can tell they're more efficient at processing speech than we are."

"Gotta be efficient at a language if you're going to be so *evasive* in it, eh?"

"If they were human I might agree with you," James replied. "But what appears to us as evasion or deceit could just as easily be explained by a reliance on smaller conceptual units."

"Conceptual units?" Bates, I was beginning to realize, never pulled up a subtitle if she could help it.

James nodded. "Like processing a line of text word by word, instead of looking at complete phrases. The smaller the units, the faster they can be reconfigured; it gives you very fast semantic reflexes. The down side is that it's difficult to maintain the same level of logical consistency, since the patterns within the larger structure are more likely to get shuffled."

"*Whoa*." Szpindel straightened, all thoughts of liquids and centripetal force forgotten.

"All I'm saying is, we aren't necessarily dealing with deliberate deception here. An entity who parses information at one scale might not be aware of inconsistencies on another; it might not even have conscious access to that level."

"That's not all you're saying."

"Isaac, you can't apply Human norms to a—"

"I *wondered* what you were up to." Szpindel dove into the transcripts. A moment later he dredged up an excerpt:

*Request information on environments you consider lethal.
Request information on your response to the prospect of
imminent exposure to lethal environments.*

GLAD TO COMPLY. BUT YOUR LETHAL IS DIFFERENT FROM US.
THERE ARE MANY MIGRATING CIRCUMSTANCES.

"You were *testing* it!" Szpindel crowed. He smacked his lips; his jaw ticced. You were looking for an emotional response!"

"It was just a thought. It didn't prove anything."

"Was there a difference? In the response time?"

James hesitated, then shook her head. "But it was a stupid idea. There are so many variables, we have no idea how they—I mean, they're *alien*..."

"The pathology's classic."

"What pathology?" I asked.

"It doesn't mean anything except that they're different from the Human baseline," James insisted. "Which is not something *anyone* here can look down their nose about."

I tried again: "What pathology?"

James shook her head. Szpindel filled me in: "There's a syndrome you might have heard about, eh? Fast talkers, no conscience, tend to malapropism and self-contradiction. No emotional affect."

"We're not talking about human beings here," James said again, softly.

"But if we were," Szpindel added, "we might call *Rorschach* a clinical sociopath."

Sarasti had said nothing during this entire exchange. Now, with the word hanging out in the open, I noticed that nobody else would look at him.

We all knew that Jukka Sarasti was a sociopath, of course. Most of us just didn't mention it in polite company.

Szpindel was never that polite. Or maybe it was just that he seemed to almost *understand* Sarasti; he could look behind the monster and regard the *organism*, no less a product of natural selection for all the human flesh it had devoured in eons past. That perspective calmed him, somehow. He could watch Sarasti watching him, and not flinch.

"I feel sorry for the poor son of a bitch," he said once, back in training.

Some would have thought that absurd. This man, so massively interfaced with machinery that his own motor skills had degraded for want of proper care and feeding; this man who heard x-rays and saw in shades of ultrasound, so corrupted by retrofits he could no longer even feel his own fingertips without assistance—this man could pity *anyone* else, let alone an infra-eyed predator built to murder without the slightest twitch of remorse?

"Empathy for sociopaths isn't common," I remarked.

"Maybe it should be. We, at least—" he waved an arm; some remote-linked sensor cluster across the simulator whirred and torqued reflexively— "*chose* the add-ons. Vampires *had* to be sociopaths. They're too much like their own prey—a lot of taxonomists don't even consider them a subspecies, you know that? Never diverged far enough for complete reproductive isolation. So maybe they're more syndrome than race. Just a bunch of obligate cannibals with a consistent set of deformities."

"And how does that make—"

"If the only thing you can eat is your own kind, empathy is

gonna be the *first* thing that goes. Psychopathy's no disorder in *those* shoes, eh? Just a survival strategy. But they still make our skin crawl, so we—chain 'em up."

"You think we should've repaired the Crucifix glitch?" Everyone knew why we hadn't. Only a fool would resurrect a monster without safeguards in place. Vampires came with theirs built in: without his antiEuclidean Sarasti would go *grand mal* the first time he caught close sight of a four-panel window frame.

But Szpindel was shaking his head. "We couldn't have fixed it. Or we *could* have," he amended, "but the glitch is in the visual cortex, eh? Linked to their omnisavantism. You fix it, you disable their pattern-matching skills, and then what's the point in even bringing them back?"

"I didn't know that."

"Well, that's the official story." He fell silent a moment, cracked a crooked grin. "Then again, we didn't have any trouble fixing the protocadherin pathways when it suited us."

I subtitled. Context-sensitive, ConSensus served up *protocadherin* γ -Y: the magical hominid brain protein that vampires had never been able to synthesize. The reason they hadn't just switched to zebras or warthogs once denied Human prey, why our discovery of the terrible secret of the Right Angle had spelled their doom.

"Anyway, I just think he's—cut off." A nervous tic tugged at the corner of Szpindel's mouth. "Lone wolf, nothing but sheep for company. Wouldn't you feel lonely?"

"They don't *like* company," I reminded him. You didn't put vampires of the same sex together, not unless you were taking bets on a bloodbath. They were solitary hunters and *very* territorial. With a minimum viable pred-prey ratio of one to ten—and human prey spread so sparsely across the Pleistocene landscape—the biggest threat to their survival had been competition from their own kind. Natural selection had never taught them to play nicely together.

That didn't cut any ice with Szpindel, though. "Doesn't mean he can't be lonely," he insisted.

"Just means he can't fix it."

THEY KNOW THE WORDS BUT NOT THE MUSIC.

—ROBERT HARE, *WITHOUT CONSCIENCE*

WE DID IT with mirrors, great round parabolic things, each impossibly thin and three times as high as a man. *Theseus* rolled them up and bolted them to firecrackers stuffed with precious antimatter from our dwindling stockpiles. With twelve hours to spare she flung them like confetti along precise ballistic trajectories, and when they were safely distant she set them alight. They pinwheeled off every which way, gamma sleeting in their wake until they burned dry. Then they coasted, unfurling mercurial insect wings across the void.

In the greater distance, four hundred thousand alien machines looped and burned and took no obvious notice.

Rorschach fell around Ben barely fifteen hundred kilometers from atmosphere, a fast endless circle that took just under forty hours to complete. By the time it didn't return to our sight, the mirrors were all outside the zone of total blindness. A closeup of Ben's equatorial edge floated in ConSensus. Mirror icons sparkled around it like an exploding schematic, like the disconnected facets of some great expanding compound eye. None had brakes. Whatever high ground the mirrors held, they wouldn't hold it for long.

"There," Bates said.

A mirage wavered stage left, a tiny spot of swirling chaos perhaps half the size of a fingernail held at arms-length. It told us nothing, it was pure heat-shimmer—but light bounced towards us from dozens of distant relayers, and while each saw scarcely more than our last probe had— a patch of dark clouds set slightly awry by some invisible prism— each of those views refracted *differently*. The Captain sieved flashes from the heavens and stitched them into a composite view.

Details emerged.

First a faint sliver of shadow, a tiny dimple all but lost in the seething equatorial cloud bands. It had just barely rotated into view around the edge of the disk— a rock in the stream perhaps, an invisible finger stuck in the clouds, turbulence and shear stress shredding the boundary layers to either side.

Szpindel squinted. "Plage effect." Subtitles said he was talking about a kind of sunspot, a knot in Ben's magnetic field.

"Higher," James said.

Something floated above that dimple in the clouds, the way a ground-effect ocean-liner floats above the depression it pushes into the water's surface. I zoomed: next to an Oasa subdwarf with ten times the mass of Jupiter, *Rorschach* was tiny.

Next to *Theseus*, it was a colossus.

Not just a torus but a *tangle*, a city-sized chaos of spun glass, loops and bridges and attenuate spires. The surface texture was pure artifice, of course; ConSensus merely giftwrapped the enigma in refracted background. Still. In some dark, haunting way, it was almost beautiful. A nest of obsidian snakes and smoky crystal spines.

"It's talking again," James reported.

"Talk back," Sarasti said, and abandoned us.

So she did: and while the Gang spoke with the artefact, the others spied upon it. Their vision failed over time—mirrors fell away along their respective vectors, lines-of-sight degraded with each passing second—but ConSensus filled with things learned in the meantime. *Rorschach* massed 1.8×10^{10} kg within a total volume of 2.3×10^8 cubic meters. Its magnetic field, judging by radio squeals and its Plage Effect, was thousands of times stronger than the sun's. Astonishingly, parts of the composite image were clear enough to discern fine spiral grooves twined around the structure. ("Fibonacci sequence," Szpindel reported, one jiggling eye fixing me for a moment. "At

least they're not *completely* alien.") Spheroid protuberances disfigured the tips of at least three of *Rorschach's* innumerable spines; the grooves were more widely spaced in those areas, like skin grown tight and swollen with infection. Just before one vital mirror sailed out of range it glimpsed another spine, split a third of the way along its length. Torn material floated flaccid and unmoving in vacuum.

"Please," Bates said softly. "Tell me that's not what it looks like."

Szpindel grinned. "Sporangium? Seed pod? Why not?"

Rorschach may have been reproducing but beyond a doubt it was *growing*, fed by a steady trickle of infalling debris from Ben's accretion belt. We were close enough now to get a clear view of that procession: rocks and mountains and pebbles fell like sediment swirling around a drain. Particles that collided with the artefact simply *stuck*; *Rorschach* engulfed prey like some vast metastatic amoeba. The acquired mass was apparently processed internally and shunted to apical growth zones; judging by infinitesimal changes in the artefact's allometry, it grew from the tips of its branches.

The procession never stopped. *Rorschach* was insatiable.

It was a strange attractor in the interstellar gulf; the paths along which the rocks fell was precisely and utterly chaotic. It was as though some Keplerian Black Belt had set up the whole system like an astronomical wind-up toy, kicked everything into motion, and let inertia do the rest.

"Didn't think that was possible," Bates said.

Szpindel shrugged. "Hey, chaotic trajectories are just as deterministic as any other kind."

"That doesn't mean you can even *predict* them, let alone set them up like that." Luminous intel reflected off the major's bald head. "You'd have to know the starting conditions of a million different variables to ten decimal places. Literally."

"Yup."

"*Vampires* can't even do that. Quanticle computers can't do that."

Szpindel shrugged like a marionette.

All the while the Gang had been slipping in and out of character, dancing with some unseen partner that—despite their best efforts—told us little beyond endless permutations of *You really wouldn't like it here*. Any interrogative it answered with another—yet somehow it always left the sense of questions answered.

"Did you send the Fireflies?" Sascha asked.

"We send many things many places," *Rorschach* replied. "What do their specs show?"

"We do not know their specifications. The Fireflies burned up over Earth."

"Then shouldn't you be looking there? When our kids fly, they're on their own."

Sascha muted the channel. "You know who we're talking to? Jesus of fucking *Nazareth*, that's who."

Szpindel looked at Bates. Bates shrugged, palms up.

"You didn't get it?" Sascha shook her head. "That last exchange was the informational equivalent of *Should we render taxes unto Caesar*. Beat for beat."

"Thanks for casting us as the Pharisees," Szpindel grumbled.

"Hey, if the Jew fits..."

Szpindel rolled his eyes.

That was when I first noticed it: a tiny imperfection on Sascha's topology, a flyspeck of doubt marring one of her facets. "We're not getting anywhere," she said. "Let's try a side door." She winked out: Michelle reopened the outgoing line. "*Theseus* to *Rorschach*. Open to requests for information."

"Cultural exchange," *Rorschach* said. "That works for me."

Bates's brow furrowed. "Is that wise?"

"If it's not inclined to give information, maybe it would rather get some. And we could learn a great deal from the kind of questions it asks."

"But—"

"Tell us about home," *Rorschach* said.

Sascha resurfaced just long enough to say "Relax, Major. Nobody said we had to give it the right answers."

The stain on the Gang's topology had flickered when Michelle

took over, but it hadn't disappeared. It grew slightly as Michelle described some hypothetical home town in careful terms that mentioned no object smaller than a meter across. (ConSensus confirmed my guess: the hypothetical limit of Firefly eyesight.) When Cruncher took a rare turn at the helm—

"We don't all of us have parents or cousins. Some never did. Some come from vats."

"I see. That's sad. Vats sounds so dehumanising."

—the stain darkened and spread across his surface like an oil slick.

"Takes too much on faith," Susan said a few moments later.

By the time Sascha had cycled back into Michelle it was more than doubt, stronger than suspicion; it had become an *insight*, a dark little meme infecting each of that body's minds in turn. The Gang was on the trail of something. They still weren't sure what.

I was.

"Tell me more about your cousins," *Rorschach* sent.

"Our cousins lie about the family tree," Sascha replied, "with nieces and nephews and Neandertals. We do not like annoying cousins."

"We'd like to know about this tree."

Sascha muted the channel and gave us a look that said *Could it be any more obvious?* "It *couldn't* have parsed that. There were three linguistic ambiguities in there. It just ignored them."

"Well, it asked for clarification," Bates pointed out.

"It asked a follow-up question. Different thing entirely."

Bates was still out of the loop. Szpindel was starting to get it, though.. .

Subtle motion drew my eye. Sarasti was back, floating above the bright topography on the table. The light show squirmed across his visor as he moved his head. I could feel his eyes behind it.

And something else, behind *him*.

I couldn't tell what it was. I could point to nothing but a vague sense of something *out of place*, somewhere in the background. Something over on the far side of the drum wasn't

quite right. No, that wasn't it; something *nearer*, something amiss somewhere along the drum's axis. But there was nothing there, nothing I could see—just the naked pipes and conduits of the spinal bundle, threading through empty space, and—

And suddenly, whatever had been wrong was right again. That was what finally locked my focus: the evaporation of some anomaly, a reversion to normalcy that caught my eye like a flicker of motion. I could see the exact spot along the bundle where the change had occurred. There was nothing out of place there now—but there *had* been. It was in my head, barely subliminal, an *itch* so close to the surface that I knew I could bring it back if I just *concentrated*.

Sascha was talking to some alien artefact at the end of a laser beam. She was going on about familial relationships, both evolutionary and domestic: Neandertal and Cro Magnon and mother's cousins twice removed. She'd been doing it for hours now and she had hours yet to go but right now her chatter was distracting me. I tried to block her out and concentrate on the half-perceived image teasing my memory. I'd *seen* something there, just a moment ago. One of the conduits had had—yes, too many joints on one of the pipes. Something that should have been straight and smooth but was somehow articulated instead. But not *one* of the pipes, I remembered: an *extra* pipe, an extra *something* anyway, something—

Boney.

That was crazy. There was nothing there. We were half a light year from home talking to unseen aliens about family reunions, and my eyes were playing tricks on me.

Have to talk to Szpindel about that, if it happened again.

A lull in the background chatter brought me back. Sascha had stopped talking. Darkened facets hung around her like a thundercloud. I pulled back the last thing she had sent: "We usually find our nephews with telescopes. They are hard as

Hobblinites."

More calculated ambiguity. And *Hobblinites* wasn't even a word.

Imminent decisions reflected in her eyes. Sascha was poised at the edge of a precipice, gauging the depth of dark waters below.

"You haven't mentioned your father at all," *Rorschach* remarked.

"That's true, *Rorschach*," Sascha admitted softly, taking a breath—

And stepping forward.

"So why don't you just *suck my big fat hairy dick*?"

The drum fell instantly silent. Bates and Szpindel stared, open-mouthed. Sascha killed the channel and turned to face us, grinning so widely I thought the top of her head would fall off.

"Sascha," Bates breathed. "Are you *crazy*?"

"So what if I am? Doesn't matter to that thing. It doesn't have a *clue* what I'm saying."

"What?"

"It doesn't even have a clue what it's saying *back*," she added.

"Wait a minute. You said—*Susan* said they weren't parrots. They knew the rules."

And there Susan was, melting to the fore: "I did, and they do. But pattern-matching doesn't equal comprehension."

Bates shook her head. "You're saying whatever we're talking to—it's not even intelligent?"

"Oh, it could be intelligent, certainly. But we're not *talking* to it in any meaningful sense."

"So what is it? Voicemail?"

"Actually," Szpindel said slowly, "I think they call it a *Chinese Room*..."

About bloody time, I thought.

I knew all about Chinese Rooms. I was one. I didn't even keep it

a secret, I told anyone who was interested enough to ask.

In hindsight, sometimes that was a mistake.

"How can you possibly tell the rest of us what your bleeding edge is up to if you don't understand it yourself?" Chelsea demanded back when things were good between us. Before she got to know me.

I shrugged. "It's not my *job* to understand them. If I could, they wouldn't be very bleeding-edge in the first place. I'm just a, you know, a conduit."

"Yeah, but how can you translate something if you *don't* understand it?"

A common cry, outside the field. People simply can't accept that patterns carry their own intelligence, quite apart from the semantic content that clings to their surfaces; if you manipulate the topology correctly, that content just—comes along for the ride.

"You ever hear of the Chinese Room?" I asked.

She shook her head. "Only vaguely. Really old, right?"

"Hundred years at least. It's a fallacy really, it's an argument that supposedly puts the lie to Turing tests. You stick some guy in a closed room. Sheets with strange squiggles come in through a slot in the wall. He's got access to this huge database of squiggles just like it, and a bunch of rules to tell him how to put those squiggles together."

"Grammar," Chelsea said. "Syntax."

I nodded. "The point is, though, he doesn't have any idea what the squiggles *are*, or what information they might contain. He only knows that when he encounters squiggle *delta*, say, he's supposed to extract the fifth and sixth squiggles from file *theta* and put them together with another squiggle from *gamma*. So he builds this response string, puts it on the sheet, slides it back out the slot and takes a nap until the next iteration. Repeat until the remains of the horse are well and thoroughly beaten."

"So he's carrying on a conversation," Chelsea said. "In Chinese, I assume, or they would have called it the Spanish Inquisition."

"Exactly. Point being you can use basic pattern-matching

algorithms to participate in a conversation *without having any idea what you're saying*. Depending on how good your rules are, you can pass a Turing test. You can be a wit and raconteur in a language you don't even speak."

"That's synthesis?"

"Only the part that involves downscaling semiotic protocols. And only in principle. And I'm actually getting my input in Cantonese and replying in German, because I'm more of a conduit than a conversant. But you get the idea."

"How do you keep all the rules and protocols straight? There must be millions of them."

"It's like anything else. Once you learn the rules, you do it unconsciously. Like riding a bike, or pinging the noosphere. You don't actively think about the protocols at all, you just—*imagine* how your targets behave."

"Mmm." A subtle half-smile played at the corner of her mouth. "But—the argument's not really a fallacy then, is it? It's spot-on: you really *don't* understand Cantonese or German."

"The *system* understands. The whole Room, with all its parts. The guy who does the scribbling is just one component. You wouldn't expect a single neuron in your head to understand English, would you?"

"Sometimes one's all I can spare." Chelsea shook her head. She wasn't going to let it go. I could see her sorting questions in order of priority; I could see them getting increasingly—personal...

"To get back to the matter at hand," I said, preempting them all, "you were going to show me how to do that thing with the fingers..."

A wicked grin wiped the questions right off her face. "Oooh, that's *right*..."

It's risky, getting involved. Too many confounds. Every tool in the shed goes dull and rusty the moment you get entangled with the system you're observing.

Still serviceable in a pinch, though.

"It hides now," Sarasti said. "It's vulnerable now.

"Now we go in."

It wasn't news so much as review: we'd been straight-lining towards Ben for days now. But perhaps the Chinese Room Hypothesis had strengthened his resolve. At any rate, with *Rorschach* in eclipse once more, we prepared to take intrusiveness to the next level.

Theseus was perpetually gravid; a generic probe incubated in her fabrication plant, its development arrested just short of birth in anticipation of unforeseen mission requirements. Sometime between briefings the Captain had brought it to parturition, customized for close contact and ground work. It burned down the well at high gee a good ten hours before *Rorschach's* next scheduled appearance, inserted itself into the rock stream, and went to sleep. If our calculations were in order, it would not be smashed by some errant piece of debris before it woke up again. If all went well, an intelligence that had precisely orchestrated a cast of millions would not notice one extra dancer on the floor. If we were just plain lucky, the myriad high-divers that happened to be line-of-sight at the time were not programmed as tattletales.

Acceptable risks. If we hadn't been up for them, we might as well have stayed home.

And so we waited: four optimized hybrids somewhere past the threshold of mere humanity, one extinct predator who'd opted to command us instead of eating us alive. We waited for *Rorschach* to come back around the bend. The probe fell smoothly around the well, an ambassador to the unwilling—or, if the Gang was right, maybe just a back-door artist set to B&E an empty condo. Szpindel had named it *Jack-in-the-box*, after some antique child's toy that didn't even rate a listing in ConSensus; we fell in its wake, nearly ballistic now, momentum and inertia carefully precalculated to thread us through the chaotic minefield of Ben's accretion belt.

Kepler couldn't do it all, though; *Theseus* grumbled briefly now and then, the intermittent firing of her attitude jets rumbling softly up the spine as the Captain tweaked our descent into the Maelstrom.

No plan ever survives contact with the enemy I remembered, but I didn't know from where.

"Got it," Bates said. A speck appeared at Ben's edge; the display zoomed instantly to closeup. "Proximity boot."

Rorschach remained invisible to *Theseus*, close as we were, close as we were coming. But parallax stripped at least some of the scales from the probe's eyes; it woke to spikes and spirals of smoky glass flickering in and out of view, Ben's flat endless horizon semivisible through the intervening translucence. The view trembled; waveforms rippled across ConSensus.

"Quite the magnetic field," Szpindel remarked.

"Braking," Bates reported. Jack turned smoothly retrograde and fired its torch. On Tactical, delta-vee swung to red.

Sascha was driving the Gang's body this shift. "Incoming signal," she reported. "Same format."

Sarasti clicked. "Pipe it."

"*Rorschach* to *Theseus*. Hello again, *Theseus*." The voice was female this time, and middle-aged.

Sascha grinned "See? She's not offended at all. Big hairy dick notwithstanding."

"Don't answer," Sarasti said.

"Burn complete," Bates reported.

Coasting now, Jack—*sneezed*. Silver chaff shot into the void towards the target: millions of compass needles, brilliantly reflective, fast enough to make *Theseus* seem slow. They were gone in an instant. The probe watched them flee, swept laser eyes across every degree of arc, scanned its sky twice a second and took careful note of each and every reflective flash. Only at first did those needles shoot along anything approaching a straight line: then they swept abruptly into Lorentz spirals, twisted into sudden arcs and corkscrews, shot away along new and intricate trajectories bordering on the relativistic. The contours of *Rorschach*'s magnetic field resolved in ConSensus, at

first glance like the nested layers of a glass onion.

"*Sproinnng*," Szpindel said.

At second glance the onion grew wormy. Invaginations appeared, long snaking tunnels of energy proliferating fractally at every scale.

"*Rorschach* to *Theseus*. Hello, *Theseus*. You there?"

A holographic inset beside the main display plotted the points of a triangle in flux: *Theseus* at the apex, *Rorschach* and Jack defining the narrow base.

"*Rorschach* to *Theseus*. I seeee you...."

"She's got a more casual affect than *he* ever did." Sascha glanced up at Sarasti, and did not add *You sure about this?* She was starting to wonder herself, though. Starting to dwell on the potential consequences of being *wrong*, now that we were committed. As far as sober second thought was concerned it was too little too late; but for Sascha, that was progress.

Besides, it had been Sarasti's decision.

Great hoops were resolving in *Rorschach's* magnetosphere. Invisible to human eyes, their outlines were vanishingly faint even on Tactical; the chaff had scattered so thinly across the sky that even the Captain was resorting to guesswork. The new macrostructures hovered in the magnetosphere like the nested gimbals of some great phantom gyroscope.

"I see you haven't changed your vector," *Rorschach* remarked. "We really wouldn't advise continuing your approach. Seriously. For your own safety."

Szpindel shook his head. "Hey, Mandy. *Rorschach* talking to Jack at all?"

"If it is, I'm not seeing it. No incident light, no directed EM of any kind." She smiled grimly. "Seems to have snuck in under the radar. And don't call me Mandy."

Theseus groaned, twisting. I staggered in the low pseudograv, reached out to steady myself. "Course correction," Bates reported. "Unplotted rock."

"*Rorschach* to *Theseus*. Please respond. Your current heading is unacceptable, repeat, your current heading is *unacceptable*. *Strongly* advise you change course."

By now the probe coasted just a few kilometers off *Rorschach's* leading edge. That close it served up way more than magnetic fields: it presented *Rorschach* itself in bright, tactical color codes. Invisible curves and spikes iridesced in ConSensus across any number of on-demand pigment schemes: gravity, reflectivity, blackbody emissions. Massive electrical bolts erupting from the tips of thorns rendered in lemon pastels. User-friendly graphics had turned *Rorschach* into a cartoon.

"*Rorschach* to *Theseus*. Please respond."

Theseus growled to stern, fishtailing. On tactical, another just-plotted piece of debris swept by a discreet six thousand meters to port.

"*Rorschach* to *Theseus*. If you are unable to respond, please—*holy shit!*"

The cartoon flickered and died.

I'd seen what had happened in that last instant, though: Jack passing near one of those great phantom hoops; a tongue of energy flicking out, quick as a frog's; a dead feed.

"I see what you're up to *now*, you *cocksuckers*. Do you think we're fucking *blind* down here?"

Sascha clenched her teeth. "We—"

"No," Sarasti said.

"But it *fi*—"

Sarasti *hissed*, from somewhere in the back of his throat. I had never heard a mammal make a noise quite like that before. Sascha fell immediately silent.

Bates negotiated with her controls. "I've still got—just a sec —"

"You pull that thing back *right fucking now*, you hear us? *Right fucking now*."

"*Got it*." Bates gritted as the feed came back up. "Just had to reacquire the laser." The probe had been kicked wildly off-course—as if someone fording a river had been caught in sudden undertow and thrown over a waterfall—but it was still talking, and still mobile.

Barely. Bates struggled to stay the course. Jack staggered and wobbled uncontrollably though the tightly-wound folds of

Rorschach's magnetosphere. The artefact loomed huge in its eye. The feed strobed.

"Maintain approach," Sarasti said calmly.

"Love to," Bates gritted. "Trying."

Theseus skidded again, corkscrewing. I could have sworn I heard the bearings in the drum *grind* for a moment. Another rock sailed past on Tactical.

"I thought you'd *plotted* those things," Szpindel grumbled.

"*You want to start a war, Theseus?* Is that what you're trying to do? You think you're up for it?"

"It doesn't attack," Sarasti said.

"Maybe it does." Bates kept her voice low; I could see the effort it took. "If *Rorschach* can control the trajectories of these —"

"Normal distribution. Insignificant corrections." He must have meant statistically: the torque and grind of the ship's hull felt pretty significant to the others.

"Oh, right," *Rorschach* said suddenly. "We get it *now*. You don't think there's anyone here, do you? You've got some high-priced consultant telling you there's nothing to worry about."

Jack was deep in the forest. We'd lost most of the tactical overlays to reduced baud. In dim visible light *Rorschach's* great ridged spines, each the size of a skyscraper, hashed a nightmare view on all sides. The feed stuttered as Bates struggled to keep the beam aligned. ConSensus painted walls and airspace with arcane telemetry. I had no idea what any of it meant.

"You think we're nothing but a *Chinese Room*," *Rorschach* sneered.

Jack stumbled towards collision, grasping for something to hang on to.

"Your mistake, *Theseus*."

It hit something. It stuck.

And suddenly *Rorschach* snapped into view—no refractory composites, no profiles or simulations in false color. There it was at last, naked even to Human eyes.

Imagine a crown of thorns, twisted, dark and unreflective, grown too thickly tangled to ever rest on any human head. Put

it in orbit around a failed star whose own reflected half-light does little more than throw its satellites into silhouette. Occasional bloody highlights glinted like dim embers from its twists and crannies; they only emphasized the darkness everywhere else.

Imagine an artefact that embodies the very notion of torture, something so wrenched and disfigured that even across uncounted lightyears and unimaginable differences in biology and outlook, you can't help but feel that somehow, the structure itself is in pain.

Now make it the size of a city.

It flickered as we watched. Lightning arced from recurved spines a thousand meters long. ConSensus showed us a strobelit hellscape, huge and dark and twisted. The composites had lied. It was not the least bit beautiful.

"Now it's too late," something said from deep inside. "Now every last one of you is dead. And Susan? You there, Susan?"

"We're taking you *first*."

LIFE'S TOO SHORT FOR CHESS.

—LORD BYRON

THEY NEVER SEALED the hatch behind them. It was too easy to get lost up there in the dome, naked infinite space stretching a hundred eighty degrees on every axis. They needed all that emptiness but they needed an anchor in its midst: soft stray light from astern, a gentle draft from the drum, the sounds of people and machinery close by. They needed to have it both ways.

I lay in wait. Reading a dozen blatant cues in their behavior, I was already squirreled away in the forward airlock when they passed. I gave them a few minutes and crept forward to the darkened bridge.

"Of course they called her by name," Szpindel was saying.

"That was the only name they had. She *told* them, remember?"

"Yes." Michelle didn't seem reassured.

"Hey, it was *you* guys said we were talking to a Chinese Room. You saying you were wrong?"

"We—no. Of course not."

"Then it wasn't really threatening Suze at all, was it? It wasn't threatening any of us. It had no idea what it was saying."

"It's *rule-based*, Isaac. It was following some kind of flowchart it drew up by observing Human languages in action. And somehow those rules told it to respond with threats of violence."

"But if it doesn't even know what it was saying—"

"It doesn't. It can't. We parsed the phrasing nineteen different ways, tried out conceptual units of every different length..." A long, deep breath. "But it attacked the probe, Isaac."

"Jack just got too close to one of those electrode thingies is all. It just arced."

"So you don't think *Rorschach* is hostile?"

Long silence—long enough to make me wonder if I'd been detected.

"*Hostile*," Szpindel said at last. "*Friendly*. We learned those words for life on Earth, eh? I don't know if they even apply out here." His lips smacked faintly. "But I think it might be something *like* hostile."

Michelle sighed. "Isaac, there's no *reason* for—I mean, it just doesn't make *sense* that it would be. We can't have anything it wants."

"It says it wants to be left alone," Szpindel said. "Even if it doesn't mean it."

They floated quietly for a while, up there past the bulkhead.

"At least the shielding held," Szpindel said finally. "That's something." He wasn't just talking about Jack; our own carapace was coated with the same stuff now. It had depleted our substrate stockpiles by two thirds, but no one wanted to rely on the ship's usual magnetics in the face of anything that could play so easily with the electromagnetic spectrum.

"If they attack us, what do we do?" Michelle said.

"Learn what we can, while we can. Fight back. While we can."

"If we can. Look out there, Isaac. I don't care how *embryonic* that thing is. Tell me we're not hopelessly outmatched."

"Outmatched, for sure. *Hopelessly*, never."

"That's not what you said before."

"Still. There's always a way to win."

"If I said that, you'd call it wishful thinking."

"If you said that, it would be. But I'm saying it, so it's game theory."

"Game theory again. Jesus, Isaac."

"No, listen. You're thinking about the aliens like they were some kind of mammal. Something that *cares*, something that looks after its investments."

"How do you know they aren't?"

"Because you can't protect your kids when they're lightyears away. They're on their own, and it's a big cold dangerous universe so most of them aren't going to make it, eh? The most you can do is crank out *millions* of kids, take cold comfort in knowing that a few always luck out through random chance. It's not a mammal mind-set, Meesh. You want an earthbound simile, think of dandelion seeds. Or, or herring."

A soft sigh. "So they're interstellar herring. That hardly means they can't crush us."

"But they don't know about *us*, not in advance. Dandelion seed doesn't know what it's up against before it sprouts. Maybe nothing. Maybe some spastic weed that goes over like straw in the wind. Or maybe something that kicks its ass halfway to the Magellanic Clouds. It doesn't *know*, and there's no such thing as a one-size-fits-all survival strategy. Something that aces against one player blows goats against a different one. So the best you can do is mix up your strategies based on the odds. It's a weighted dice roll and it gives you the best mean payoff over the whole game, but you're bound to crap out and choose the wrong strategy at least some of the time. Price of doing business. And that means—*that* means—that weak players not only *can* win against stronger ones, but they're statistically

bound to in some cases."

Michelle snorted. "*That's* your game theory? Rock Paper Scissors with statistics?"

Maybe Szpindel didn't know the reference. He didn't speak, long enough to call up a subtitle; then he brayed like a horse. "*Rock Paper Scissors!* Yes!"

Michelle digested that for a moment. "You're sweet for trying, but that only works if the other side is just blindly playing the odds, and they don't have to *do* that if they know who they're going up against in advance. And my dear, they have so very much information about *us*..."

They'd threatened Susan. By name.

"They don't know everything," Szpindel insisted. "And the principle works for *any* scenario involving incomplete information, not just the ignorant extreme."

"Not as well."

"But *some*, and that gives us a chance. Doesn't matter how good you are at poker when it comes to the deal, eh? Cards still deal out with the same odds."

"So that's what we're playing. Poker."

"Be thankful it's not chess. We wouldn't have a hope in hell."

"Hey. *I'm* supposed to be the optimist in this relationship."

"You are. I'm just fatalistically cheerful. We all come into the story halfway through, we all catch up as best we can, and we're all gonna die before it ends."

"That's my Isaac. Master of the no-win scenario."

"You can win. Winner's the guy who makes the best guess on how it all comes out."

"So you *are* just guessing."

"Yup. And you can't make an informed guess without data, eh? And we could be the very first to find out what's gonna happen to the whole Human race. I'd say that puts us into the semifinals, easy."

Michelle didn't answer for a very long time. When she did, I couldn't hear her words.

Neither could Szpindel: "Sorry?"

"*Covert to invulnerable*, you said. Remember?"

"Uh huh. *Rorschach's* Graduation Day. "

"How soon, do you think?"

"No idea. But I don't think it's the kind of thing that's gonna slip by unnoticed. And that's why I don't think it attacked us."

She must have looked a question.

"Because when it does, it won't be some debatable candy-ass bitch slap," he told her. "When that fucker rises up, we're gonna know."

A sudden flicker from behind. I spun in the cramped passageway and bit down on a cry: something squirmed out of sight around the corner, something with *arms*, barely glimpsed, gone in an instant.

Never there. Couldn't be there. Impossible.

"Did you hear that?" Szpindel asked, but I'd fled to stern before Michelle could answer him.

We'd fallen so far that the naked eye didn't see a disk, barely even saw curvature any more. We were falling towards a *wall*, a vast roiling expanse of dark thunderclouds that extended in all directions to some new, infinitely-distant horizon. Ben filled half the universe.

And still we fell.

Far below, Jack clung to *Rorschach's* ridged surface with bristly gecko-feet fenders and set up camp. It sent x-rays and ultrasound into the ground, tapped enquiring fingers and listened to the echos, planted tiny explosive charges and measured the resonance of their detonations. It shed seeds like pollen: tiny probes and sensors by the thousands, self-powered, near-sighted, stupid and expendable. The vast majority were sacrificial offerings to random chance; only one in a hundred lasted long enough to return usable telemetry.

While our advance scout took measure of its local neighborhood, *Theseus* drew larger-scale birdseye maps from the closing sky. It spat out thousands of its own disposable

probes, spread them across the heavens and collected stereoscopic data from a thousand simultaneous perspectives.

Patchwork insights assembled in the drum. *Rorschach*'s skin was sixty percent superconducting carbon nanotube. *Rorschach*'s guts were largely hollow; at least some of those hollows appeared to contain an atmosphere. No earthly form of life would have lasted a second in there, though; intricate topographies of radiation and electromagnetic force seethed around the structure, seethed within it. In some places the radiation was intense enough to turn unshielded flesh to ash in an instant; calmer backwaters would merely kill in the same span of time. Charged particles raced around invisible racetracks at relativistic speeds, erupting from jagged openings, hugging curves of magnetic force strong enough for neutron stars, arcing through open space and plunging back into black mass. Occasional protuberances swelled and burst and released clouds of microparticulates, seeding the radiation belts like spores. *Rorschach* resembled nothing so much as a nest of half-naked cyclotrons, tangled one with another.

Neither Jack below nor *Theseus* above could find any points of entry, beyond those impassable gaps that spat out streams of charged particles or swallowed them back down. No airlocks or hatches or viewports resolved with increasing proximity. The fact that we'd been threatened via laser beam implied some kind of optical antennae or tightcast array; we weren't even able to find that much.

A central hallmark of von Neumann machines was self-replication. Whether *Rorschach* would meet that criterion—whether it would germinate, or divide, or give birth when it passed some critical threshold—whether it had done so already—remained an open question.

One of a thousand. At the end of it all—after all the measurements, the theorizing and deduction and outright guesswork—we settled into orbit with a million trivial details and no answers. In terms of the big questions, there was only one thing we knew for sure.

So far, *Rorschach* was holding its fire.

"It sounded to *me* like it knew what it was saying," I remarked.

"I guess that's the whole point," Bates said. She had no one to confide in, partook of no intimate dialogs that could be overheard. With her, I used the direct approach.

Theseus was birthing a litter, two by two. They were nasty-looking things, armored, squashed egg-shapes, twice the size of a human torso and studded with gardening implements: antennae, optical ports, retractable threadsaws. Weapons muzzles.

Bates was summoning her troops. We floated before the primary fab port at the base of *Theseus*' spine. The plant could just as easily have disgorged the grunts directly into the hold beneath the carapace—that was where they'd be stored anyway, until called upon—but Bates was giving each a visual inspection before sending it through one of the airlocks a few meters up the passageway. Ritual, perhaps. Military tradition. Certainly there was nothing she could see with her eyes that wouldn't be glaringly obvious to the most basic diagnostic.

"Would it be a problem?" I asked. "Running them without your interface?"

"Run themselves just fine. Response time actually improves without spam in the network. I'm more of a safety precaution."

Theseus growled, giving us more attitude. The plating trembled to stern; another piece of local debris, no longer in our path. We were angling towards an equatorial orbit just a few miniscule kilometers above the artefact; insanely, the approach curved right through the accretion belt.

It didn't bother the others. "Like surviving traffic in a high speed lane," Sascha had said, disdainful of my misgivings. "Try creeping across and you're road kill. Gotta speed up, go with the flow." But the flow was turbulent; we hadn't gone five minutes without a course correction since *Rorschach* had stopped talking to us.

"So, do you buy it?" I asked. "Pattern-matching, empty

threats? Nothing to worry about?"

"Nobody's fired on us yet," she said. Meaning: *Not for a second.*

"What's your take on Susan's argument? Different niches, no reason for conflict?"

"Makes sense, I guess." *Utter bullshit.*

"Can you think of any reason why something with such different needs *would* attack us?"

"That depends," she said, "on whether the fact that we *are* different is reason enough."

I saw playground battlefields reflected in her topology. I remembered my own, and wondered if there were any other kind.

Then again, that only proved the point. Humans didn't *really* fight over skin tone or ideology; those were just handy cues for kin-selection purposes. Ultimately it always came down to bloodlines and limited resources.

"I think Isaac would say this is different," I said.

"I guess." Bates sent one grunt humming off to the hold; two more emerged in formation, spinelight glinting off their armor.

"How many of these are you making, anyway?"

"We're breaking and entering, Siri. Not wise to leave our own house unguarded."

I inspected her surfaces as she inspected theirs. Doubt and resentment simmered just beneath.

"You're in a tough spot," I remarked.

"We all are."

"But you're responsible for defending us, against something we don't know anything about. We're only guessing that—"

"Sarasti doesn't *guess*," Bates said. "The man's in charge for a reason. Doesn't make much sense to question his orders, given we're all about a hundred IQ points short of understanding the answer anyway."

"And yet he's also got that whole predatory side nobody talks about," I remarked. "It must be difficult for him, all that intellect coexisting with so much instinctive aggression. Making sure the right part wins."

She wondered in that instant whether Sarasti might be listening in. She decided in the next that it didn't matter: why should he care what the cattle thought, as long as they did what they were told?

All she said was, "I thought you jargonauts weren't supposed to have opinions."

"That wasn't mine."

Bates paused. Returned to her inspection.

"You do know what I do," I said.

"Uh huh." The first of the current pair passed muster and hummed off up the spine. She turned to the second. "You simplify things. So the folks back home can understand what the specialists are up to."

"That's part of it."

"I don't need a translator, Siri. I'm just a consultant, assuming things go well. A bodyguard if they don't."

"You're an officer and a military expert. I'd say that makes you more than qualified when it comes to assessing *Rorschach's* threat potential."

"I'm muscle. Shouldn't you be *simplifying* Jukka or Isaac?"

"That's exactly what I'm doing."

She looked at me.

"You *interact*," I said. "Every component of the system affects every other. Processing Sarasti without factoring you in would be like trying to calculate acceleration while ignoring mass."

She turned back to her brood. Another robot passed muster.

She didn't hate *me*. What she hated was what my presence implied.

They don't trust us to speak for ourselves, she wouldn't say. No matter how qualified we are, no matter how far ahead of the pack. Maybe even because of that. We're contaminated. We're subjective. So they send Siri Keeton to tell them what we really mean.

"I get it," I said after a moment.

"Do you."

"It's not about trust, Major. It's about *location*. Nobody gets a good view of a system from the inside, no matter who they are. The view's distorted."

"And yours isn't."

"I'm outside the system."

"You're interacting with me now."

"As an observer only. Perfection's unattainable but it isn't *unapproachable*, you know? I don't play a role in decision-making or research, I don't interfere in any aspect of the mission that I'm assigned to study. But of course I ask questions. The more information I have, the better my analysis."

"I thought you didn't have to *ask*. I thought you guys could just, read the signs or something."

"Every bit helps. It all goes into the mix."

"You doing it now? *Synthesizing*?"

I nodded.

"And you do this without any specialized knowledge at all."

"I'm as much of a specialist as you. I specialize in processing informational topologies."

"Without understanding their content."

"Understanding the shapes is enough."

Bates seemed to find some small imperfection in the battlebot under scrutiny, scratched at its shell with a fingernail. "Software couldn't do that without your help?"

"Software can do a lot of things. We've chosen to do some for ourselves." I nodded at the grunt. "Your visual inspections, for example."

She smiled faintly, conceding the point.

"So I'd encourage you to speak freely. You know I'm sworn to confidentiality."

"Thanks," she said, meaning *On this ship, there's no such thing*.

Theseus chimed. Sarasti spoke in its wake: "Orbital insertion in fifteen minutes. Everyone to the drum in five."

"Well," Bates said, sending one last grunt on its way. "Here we go." She pushed off and sailed up the spine.

The newborn killing machines clicked at me. They smelled like new cars.

"By the way," Bates called over her shoulder, "you missed the obvious one."

"Sorry?"

She spun a hundred-eighty degrees at the end of the passageway, landed like an acrobat beside the drum hatch. "The reason. Why something would attack us even if we didn't have anything it wanted."

I read it off her: "If it wasn't attacking at all. If it was defending itself."

"You asked about Sarasti. Smart man. Strong Leader. Maybe could spend a little more time with the troops."

Vampire doesn't respect his command. Doesn't listen to advice. Hides away half the time.

I remembered transient killer whales. "Maybe he's being considerate." *He knows he makes us nervous.*

"I'm sure that's it," Bates said.

Vampire doesn't trust himself.

It wasn't just Sarasti. They *all* hid from us, even when they had the upper hand. They always stayed just the other side of myth.

It started pretty much the same way it did for anything else; vampires were far from the first to learn the virtues of energy conservation. Shrews and hummingbirds, saddled with tiny bodies and overclocked metabolic engines, would have starved to death overnight if not for the torpor that overtook them at sundown. Comatose elephant seals lurked breathless at the bottom of the sea, rousing only for passing prey or redline lactate levels. Bears and chipmunks cut costs by sleeping away the impoverished winter months, and lungfish—Devonian black belts in the art of estivation—could curl up and die for years, waiting for the rains.

With vampires it was a little different. It wasn't shortness of breath, or metabolic overdrive, or some blanket of snow that locked the pantry every winter. The problem wasn't so much a lack of prey as a lack of *difference* from it; vampires were such a recent split from the ancestral baseline that the reproductive rates hadn't diverged. This was no woodland-variety lynx-hare

dynamic, where prey outnumbered predators a hundred to one. Vampires fed on things that bred barely faster than they did. They would have wiped out their own food supply in no time if they hadn't learned how to ease off on the throttle.

By the time they went extinct they'd learned to shut down for *decades*.

It made two kinds of sense. It not only slashed their metabolic needs while prey bred itself back to harvestable levels, it gave us time to forget that we *were* prey. We were so smart by the Pleistocene, smart enough for easy skepticism; if you haven't seen any night-stalking demons in all your years on the savannah, why should you believe some senile campfire ramblings passed down by your mother's mother?

It was murder on our ancestors, even if those same enemy genes—co-opted now—served us so well when we left the sun a half-million years later. But it was almost—heartening, I guess—to think that maybe Sarasti felt the tug of other genes, some aversion to prolonged visibility shaped by generations of natural selection. Maybe he spent every moment in our company fighting voices that urged him to *hide, hide, let them forget*. Maybe he retreated when they got too loud, maybe we made him as uneasy as he made us.

We could always hope.

Our final orbit combined discretion and valor in equal measure.

Rorschach described a perfect equatorial circle 87,900 km from Big Ben's center of gravity. Sarasti was unwilling to let it out of sight, and you didn't have to be a vampire to mistrust relay sats when swinging through a radiation-soaked blizzard of rock and machinery. The obvious alternative was to match orbits.

At the same time, all the debate over whether or not *Rorschach* had meant—or even understood—the threats it had made was a bit beside the point. Counterintrusion measures

were a distinct possibility either way, and ongoing proximity only increased the risk. So Sarasti had derived some optimum compromise, a mildly eccentric orbit that nearly brushed the artefact at perigee but kept a discreet distance the rest of the time. It was a longer trajectory than *Rorschach's*, and higher—we had to burn on the descending arc to keep in synch—but the end result was continuously line-of-sight, and only brought us within striking distance for three hours either side of bottoming out.

Our striking distance, that is. For all we knew *Rorschach* could have reached out and swatted us from the sky before we'd even left the solar system.

Sarasti gave the command from his tent. ConSensus carried his voice into the drum as *Theseus* coasted to apogee: "Now."

Jack had erected a tent about itself, a blister glued to *Rorschach's* hull and blown semi-taut against vacuum with the merest whiff of nitrogen. Now it brought lasers to bear and started digging; if we'd read the vibrations right, the ground should be only thirty-four centimeters deep beneath its feet. The beams stuttered as they cut, despite six millimeters of doped shielding.

"Son of a bitch," Szpindel murmured. "It's *working*."

We burned through tough fibrous epidermis. We burned through veins of insulation that might have been some sort of programmable asbestos. We burned through alternating layers of superconducting mesh, and the strata of flaking carbon separating them.

We burned *through*.

The lasers shut down instantly. Within seconds *Rorschach's* intestinal gases had blown taut the skin of the tent. Black carbon smoke swirled and danced in sudden thick atmosphere.

Nothing shot back at us. Nothing reacted. Partial pressures piled up on ConSensus: methane, ammonia, hydrogen. Lots of water vapor, freezing as fast as it registered.

Szpindel grunted. "Reducing atmosphere. Pre-Snowball." He sounded disappointed.

"Maybe it's a work in progress," James suggested. "Like the

structure itself."

"Maybe."

Jack stuck out its tongue, a giant mechanical sperm with a myo-optical tail. Its head was a thick-skinned lozenge, at least half ceramic shielding by cross-section; the tiny payload of sensors at its core was rudimentary, but small enough for the whole assembly to thread through the pencil-thin hole the laser had cut. It unspooled down the hole, rimming *Rorschach's* newly-torn orifice.

"Dark down there," James observed.

Bates: "But warm." 281°K. Above freezing.

The endoscope emerged into darkness. Infrared served up a grainy grayscale of a — a tunnel, it looked like, replete with mist and exotic rock formations. The walls curved like honeycomb, like the insides of fossilized intestine. Cul-de-sacs and branches proliferated down the passage. The basic substrate appeared to be a dense pastry of carbon-fiber leaves. Some of the gaps between those layers were barely thick as fingernails; others looked wide enough to stack bodies.

"Ladies and gentlemen," Szpindel said softly, "The Devil's Baklava."

I could have sworn I saw something move. I could have sworn it looked familiar.

The camera died.

RORSCHACH

MOTHERS ARE FONDER THAN FATHERS OF THEIR CHILDREN BECAUSE THEY ARE MORE CERTAIN THEY ARE THEIR OWN.

—ARISTOTLE

I COULDN'T SAY goodbye to Dad. I didn't even know where he was.

I didn't *want* to say goodbye to Helen. I didn't want to go back there. That was the problem: I didn't have to. There was nowhere left in the world where the mountain couldn't simply pick up and move to Mohammed. Heaven was merely a suburb of the global village, and the global village left me no excuse.

I linked from my own apartment. My new inlays—mission-specific, slid into my head just the week before—shook hands with the noosphere and knocked upon the Pearly Gates. Some tame spirit, more plausible than Saint Peter if no less ethereal, took a message and disappeared.

And I was *inside*.

This was no antechamber, no visiting room. Heaven was not intended for the casual visitor; any paradise in which the flesh-constrained would feel at home would have been intolerably pedestrian to the disembodied souls who lived there. Of course, there was no reason why visitor and resident had to share the same view. I could have pulled any conventional worldview off the shelf if I'd wanted, seen this place rendered in any style I chose. Except for the Ascended themselves, of course. That was one of the perks of the Afterlife: only *they* got to choose the face we saw.

But the thing my mother had become *had* no face, and I was

damned if she was going to see me hide behind some mask.

"Hello, Helen."

"Siri! What a wonderful surprise!"

She was an abstraction in an abstraction: an impossible intersection of dozens of bright panes, as if the disassembled tiles of a stained-glass window had each been set aglow and animated. She swirled before me like a school of fish. Her world echoed her body: lights and angles and three-dimensional Escher impossibilities, piled like bright thunderheads. And yet, somehow I would have recognised her anywhere. Heaven was a dream; only upon waking do you realize that the characters you encountered looked nothing like they do in real life.

There was only one familiar landmark anywhere in the whole sensorium. My mother's heaven smelled of cinnamon.

I beheld her luminous avatar and imagined the corpus soaking in a tank of nutrients, deep underground. "How are you doing?"

"Very well. *Very* well. Of course, it takes a little getting used to, knowing your mind isn't quite *yours* any more." Heaven didn't just feed the brains of its residents; it fed *off* them, used the surplus power of idle synapses to run its own infrastructure. "You *have* to move in here, sooner better than later. You'll never leave."

"Actually, I *am* leaving," I said. "We're shipping out tomorrow."

"Shipping out?"

"The Kuiper. You know. The Fireflies?"

"Oh yes. I think I heard something about that. We don't get much news from the outside world, you know."

"Anyway, just thought I'd call in and say goodbye."

"I'm glad you did. I've been hoping to see you without, you know."

"Without what?"

"You know. Without your father listening in."

Not again.

"Dad's in the field, Helen. Interplanetary crisis. You might have heard something."

"I certainly have. You know, I haven't always been happy about your father's—extended assignments, but maybe it was really a blessing in disguise. The less he was around, the less he could do."

"Do?"

"To you." The apparition stilled for a few moments, feigning hesitation. "I've never told you this before, but—no. I shouldn't."

"Shouldn't what?"

"Bring up, well, old hurts."

"What old hurts?" Right on cue. I couldn't help myself, the training went too deep. I always barked on command.

"Well," she began, "sometimes you'd come back—you were so very young—and your face would be so set and hard, and I'd wonder why are you so *angry*, little boy? What can someone so young have to be so angry about?"

"Helen, what are you talking about? Back from where?"

"Just from the places he'd take you." Something like a shiver passed across her facets. "He was still around back then. He wasn't so *important*, he was just an accountant with a karate fetish, going on about forensics and game theory and astronomy until he put everyone to sleep."

I tried to imagine it: my father, the chatterbox. "That doesn't sound like Dad."

"Well of course not. You were too young to remember, but he was just a little man, then. He still is, really, under all the secret missions and classified briefings. I've never understood why people never saw that. But even back then he liked to—well, it wasn't his fault, I suppose. He had a very difficult childhood, and he never learned to deal with problems like an adult. He, well, he'd throw his weight around, I guess you'd say. Of course I didn't know that before we married. If I had, I—but I made a commitment. I made a commitment, and I never broke it."

"What, are you saying you were abused?" *Back from the places he'd take you.* "Are—are you saying I was?"

"There are all kinds of abuse, Siri. Words can hurt more than bullets, sometimes. And child abandonment—"

"He didn't abandon me." *He left me with you.*

"He abandoned *us*, Siri. Sometimes for months at a time, and I—and we never knew if he was coming back And he *chose* to do that to us, Siri. He didn't *need* that job, there were so many other things he was qualified to do. Things that had been redundant for years."

I shook my head, incredulous, unable to say it aloud: she hated him because he hadn't had the good grace to grow *unnecessary*?

"It's not Dad's fault that planetary security is still an essential service," I said.

She continued as if she hadn't heard. "Now there was a time when it was unavoidable, when people our age *had* to work just to make ends meet. But even back then people *wanted* to spend time with their families. Even if they couldn't afford to. To, to *choose* to stay working when it isn't even *necessary*, that's—" She shattered and reassembled at my shoulder. "Yes, Siri. I believe that's a kind of abuse. And if your father had been half as loyal to me as I've been to him all these years..."

I remembered Jim, the last time I'd seen him: snorting vassopressin under the restless eyes of robot sentries. "I don't think Dad's been disloyal to either of us."

Helen sighed. "I don't really expect you to understand. I'm not completely stupid, I've seen how it played out. I pretty much had to raise you myself all these years. I always had to play the heavy, always had to be the one to hand out the discipline because your father was off on some *secret assignment*. And then he'd come home for a week or two and he was the golden-haired boy just because he'd seen fit to drop in. I don't really blame you for that any more than I blame him. Blame doesn't solve anything at this stage. I just thought—well, really, I thought you ought to know. Take it for what it's worth."

A memory, unbidden: called into Helen's bed when I was nine, her hand stroking my scar, her stale sweet breath stirring against my cheek. *You're the man of the house now Siri. We can't count on your father any more. It's just you and me...*

I didn't say anything for a while. Finally: "Didn't it help at

all?"

"What do you mean?"

I glanced around at all that customized abstraction: internal feedback, lucidly dreamed. "You're omnipotent in here. Desire anything, imagine anything; there it is. I'd thought it would have *changed* you more."

Rainbow tiles danced, and forced a laugh. "This isn't enough of a *change* for you?"

Not nearly.

Because Heaven had a catch. No matter how many constructs and avatars Helen built in there, no matter how many empty vessels sang her praises or commiserated over the injustices she'd suffered, when it came right down to it she was only talking to herself. There were other realities over which she had no control, other people who didn't play by her rules—and if they thought of Helen at all, they thought as they damn well pleased.

She could go the rest of her life without ever meeting any of them. But she knew they were out there, and it drove her crazy. Taking my leave of Heaven, it occurred to me that omnipotent though she was, there was only be one way my mother would ever be truly happy in her own personal creation.

The rest of creation would have to go.

"This shouldn't keep happening," Bates said. "The shielding was good."

The Gang was up across the drum, squaring away something in their tent. Sarasti lurked offstage today, monitoring the proceedings from his quarters. That left me with Bates and Szpindel in the Commons.

"Maybe against direct EM." Szpindel stretched, stifled a yawn. "Ultrasound boots up magnetic fields through shielding sometimes, in living tissue at least. Any chance something like that could be happening with your electronics?"

Bates spread her hands. "Who knows? Might as well be black magic and elves down there."

"Well, it's not a total wash. We can make a few smart guesses, eh?"

"Such as."

Szpindel raised one finger. "The layers we cut through couldn't result from any metabolic process *I* know about. So it's not 'alive', not in the biological sense. Not that that means anything these days," he added, glancing around the belly of our beast.

"What about life *inside* the structure?"

"Anoxic atmosphere. Probably rules out complex multicellular life. Microbes, maybe, although if so I wish to hell they show up in the samples. But anything complex enough to think, let alone build something like *that*"—a wave at the image in ConSensus—"is gonna need a high-energy metabolism, and that means oxygen."

"So you think it's empty?"

"Didn't say that, did I? I know aliens are supposed to be all mysterious and everything, but I still don't see why *anyone* would build a city-sized wildlife refuge for anaerobic microbes."

"It's got to be a habitat for *something*. Why any atmosphere at all, if it's just some kind of terraforming machine?"

Szpindel pointed up at the Gang's tent. "What Susan said. Atmosphere's still under construction and we get a free ride until the owners show up."

"Free?"

"Freeish. And I know we've only seen a fraction of a fraction of what's inside. But something obviously saw us coming. It yelled at us, as I recall. If they're smart and they're hostile, why aren't they shooting?"

"Maybe they are."

"If something's hiding down the hall wrecking your robots, it's not frying them any faster than the baseline environment would do anyway."

"What you call a *baseline environment* might be an active counterintrusion measure. Why else would a *habitat* be so

uninhabitable?"

Szpindel rolled his eyes. "Okay, I was wrong. We *don't* know enough to make a few smart guesses."

Not that we hadn't tried. Once Jack's sensor head had been irreparably fried, we'd relegated it to surface excavation; it had widened the bore in infinitesimal increments, patiently burning back the edges of our initial peephole until it measured almost a meter across. Meanwhile we'd customized Bates's grunts—shielded them against nuclear reactors and the insides of cyclotrons—and come perigee we'd thrown them at *Rorschach* like stones chucked into a haunted forest. Each had gone through Jack's portal, unspooling whisker-thin fiberop behind them to pass intelligence through the charged atmosphere.

They'd sent glimpses, mostly. A few extended vignettes. We'd seen *Rorschach's* walls move, slow lazy waves of peristalsis rippling along its gut. We'd seen treachery invaginations in progress, painstaking constrictions that would presumably, given time, seal off a passageway. Our grunts had sailed through some quarters, staggered through others where the magnetic ambience threw them off balance. They'd passed through strange throats lined with razor-thin teeth, thousands of triangular blades in parallel rows, helically twisted. They'd edged cautiously around clouds of mist sculpted into abstract fractal shapes, shifting and endlessly recursive, their charged droplets strung along a myriad converging lines of electromagnetic force.

Ultimately, every one of them had died or disappeared.

"Any way to increase the shielding?" I wondered.

Szpindel gave me a look.

"We've shielded everything except the sensor heads," Bates explained. "If we shield *those* we're blind."

"But visible light's harmless enough. What about purely optical li—"

"We're *using* optical links, commissar," Szpindel snapped. "And you may have noticed the shit's getting through anyway."

"But aren't there, you know—" I groped for the word—"bandpass filters? Something that lets visible wavelengths

through, cuts out the lethal stuff on both sides?"

He snorted. "Sure. It's called an atmosphere, and if we'd brought one with us—about fifty times deeper than Earth's— it *might* block some of that soup down there. Course, Earth also gets a lot of help from its magnetic field, but I'm not betting my life on any EM we set up in *that* place."

"If we didn't keep running into these *spikes*," Bates said. "That's the real problem."

"Are they random?" I wondered.

Szpindel's shrug was half shiver. "I don't think anything about that place is random. But who knows? We need more data."

"Which we're not likely to get," James said, walking around the ceiling to join us, "if our drones keep shorting out."

The conditional was pure formality. We'd tried playing the odds, sacrificing drone after drone in the hope that one of them would get lucky; survival rates tailed exponentially to zero with distance from base camp. We'd tried shielding the fiberop to reduce aperture leakage; the resulting tethers were stiff and unwieldy, wrapped in so many layers of ferroceramic that we were virtually waving the bots around on the end of a stick. We'd tried cutting the tethers entirely, sending the machines out to explore on their own, squinting against the radiant blizzard and storing their findings for later download; none had returned. We'd tried everything.

"We can go in ourselves," James said.

Almost everything.

"Right," Szpindel replied in a voice that couldn't mean anything but *wrong*.

"It's the only way to learn anything useful."

"Yeah. Like how many seconds it would take your brain to turn into synchrotron soup."

"Our suits can be shielded."

"Oh, you mean like Mandy's drones?"

"I'd really rather you didn't call me that," Bates remarked.

"The point is, *Rorschach* kills you whether you're meat or mechanical."

"My point is that it kills meat *differently*," James replied. "It

takes longer."

Szpindel shook his head. "You'd be good as dead in fifty minutes. Even shielded. Even in the so-called cool zones."

"And completely asymptomatic for three hours or more. And even after that it would take days for us to actually die *and we'd be back here long before then*, and the ship could patch us up just like that. We even know that much, Isaac, it's right there in ConSensus. And if we know it, you know it. So we shouldn't even be having this argument."

"That's your solution? We saturate ourselves with radiation every thirty hours and then I get to cut out the tumors and stitch everyone's cells back together?"

"The pods are automatic. You wouldn't have to lift a finger."

"Not to mention the number those magnetic fields would do on your *brain*. We'd be hallucinating from the moment we—"

"Faraday the suits."

"Ah, so we go in deaf dumb and blind. Good idea."

"We can let light pass. Infrared—"

"It's all *EM*, Suze. Even if we blacked out our helmets completely and used a camera feed, we'd get leakage where the wire went through."

"Some, yes. But it'd be better than—"

"Jesus." A tremor sent spittle sailing from the corner of Szpindel's mouth. "Let me talk to Mi—"

"I've discussed it with the rest of the gang, Isaac. We're all agreed."

"*All* agreed? You don't have a working majority in there, Suze. Just because you cut your brain into pieces doesn't mean they each get a vote."

"I don't see why not. We're each at least as sentient as you are."

"They're all *you*. Just partitioned."

"You don't seem to have any trouble treating Michelle as a separate individual."

"Michelle's—I mean, yes, you're all very different *facets*, but there's only one original. Your alters—"

"*Don't call us that*." Sascha erupted with a voice cold as LOX.

"Ever."

Szpindel tried to pull back. "I didn't mean—you know I didn't —"

But Sascha was gone. "What are you saying?" said the softer voice in her wake. "Do you think I'm just, I'm just *Mom*, play-acting? You think when we're together you're alone with *her*?"

"Michelle," Szpindel said miserably. "No. What I think—"

"Doesn't matter," Sarasti said. "We don't *vote* here."

He floated above us, visored and unreadable in the center of the drum. None of us had seen him arrive. He turned slowly on his axis, keeping us in view as we rotated around him.

"Prepping *Scylla*. Amanda needs two untethered grunts with precautionary armament. Cams from one to a million Angstroms, shielded tympanics, no autonomous circuitry. Platelet boosters, dimenhydrinate and potassium iodide for everyone by 1350."

"Everyone?" Bates asked.

Sarasti nodded. "Window opens four hours twenty-three." He turned back down the spine

"Not me," I said.

Sarasti paused.

"I don't participate in field ops," I reminded him.

"Now you do."

"I'm a *synthesist*." He knew that. Of course he knew, everyone did: you can't observe the system unless you stay *outside* the system.

"On Earth you're a synthesist," he said. "In the Kuiper you're a synthesist. Here you're mass. Do what you're told."

He disappeared.

"Welcome to the big picture," Bates said softly.

I looked at her as the rest of the group broke up. "You know I —"

"We're a long way out, Siri. Can't wait fourteen months for feedback from your bosses, and you know it."

She leapt from a standing start, arced smoothly through holograms into the weightless core of the drum. But then she stopped herself, as if distracted by some sudden insight. She

grabbed a spinal conduit and swung back to face me.

"You shouldn't sell yourself short," she said. "Or Sarasti either. You're an observer, right? It's a safe bet there's going to be a lot down there worth observing."

"Thanks," I said. But I already knew why Sarasti was sending me into *Rorschach*, and there was more to it than *observation*.

Three valuable agents in harm's way. A decoy bought one-in-four odds that an enemy would aim somewhere else.

THE LORD WILL TAKE CONTROL OF YOU. YOU WILL DANCE
AND SHOUT AND BECOME A DIFFERENT PERSON.

—1 SAMUEL 10:6

"WE WERE PROBABLY fractured during most of our evolution," James once told me, back when we were all still getting acquainted. She tapped her temple. "There's a lot of room up here; a modern brain can run dozens of sentient cores without getting too crowded. And parallel multitasking has obvious survival advantages."

I nodded. "Ten heads are better than one."

"Our integration may have actually occurred quite recently. Some experts think we can still revert to multiples under the right circumstances."

"Well, of course. You're living proof."

She shook their head. "I'm not talking about *physical* partitioning. We're the state of the art, certainly, but theoretically surgery isn't even necessary. Simple stress could do something like it, if it was strong enough. If it happened early in childhood."

"No kidding."

"Well, in theory," James admitted, and changed into Sascha who said, "*Bullshit in theory*. There's documented cases as recently as fifty years ago."

"Really." I resisted the temptation to look it up on my inlays; the unfocused eyes can be a giveaway. "I didn't know."

"Well it's not like anyone talks about it *now*. People were fucking *barbarians* about multicores back then—called it a *disorder*, treated it like some kind of disease. And their idea of a cure was to keep one of the cores and murder all the others. Not that they called it *murder*, of course. They called it *integration* or some shit. That's what people did back then: created other people to suck up all the abuse and torture, then got rid of them when they weren't needed any more."

It hadn't been the tone most of us were looking for at an ice-breaking party. James had gently eased back into the driver's seat and the conversation had steered closer to community standards.

But I hadn't heard any of the Gang use *alter* to describe each other, then or since. It had seemed innocuous enough when Szpindel had said it. I wondered why they'd taken such offence—and now, floating alone in my tent with a few pre-op minutes to kill, there was no one to see my eyes glaze.

Alter carried baggage over a century old, ConSensus told me. Sascha was right; there'd been a time when MCC was MPD, a *Disorder* rather than a *Complex*, and it had *never* been induced deliberately. According to the experts of that time, multiple personalities arose spontaneously from unimaginable cauldrons of abuse—fragmentary personae offered up to suffer rapes and beatings while the child behind took to some unknowable sanctuary in the folds of the brain. It was both survival strategy and ritual self-sacrifice: powerless souls hacking themselves to pieces, offering up quivering chunks of self in the desperate hope that the vengeful gods called *Mom* or *Dad* might not be insatiable.

None of it had been real, as it turned out. Or at least, none of it had been confirmed. The experts of the day had been little more than witch doctors dancing through improvised rituals: meandering free-form interviews full of leading questions and nonverbal cues, scavenger hunts through regurgitated childhoods. Sometimes a shot of lithium or haloperidol when

the beads and rattles didn't work. The technology to map minds was barely off the ground; the technology to edit them was years away. So the *therapists* and *psychiatrists* poked at their victims and invented names for things they didn't understand, and argued over the shrines of Freud and Klein and the old Astrologers. Doing their very best to sound like practitioners of Science.

Inevitably, it was Science that turned them all into road kill; MPD was a half-forgotten fad even before the advent of synaptic rewiring. But *alter* was a word from that time, and its resonance had persisted. Among those who remembered the tale, *alter* was codespeak for *betrayal* and *human sacrifice*. *Alter* meant *cannon fodder*.

Imagining the topology of the Gang's coexisting souls, I could see why Sascha embraced the mythology. I could see why Susan let her. After all, there was nothing implausible about the concept; the Gang's very existence proved that much. And when you've been peeled off from a pre-existing entity, sculpted from nonexistence straight into adulthood—a mere fragment of personhood, without even a full-time body to call your own—you can be forgiven a certain amount of anger. Sure you're all equal, all in it together. Sure, no persona is better than any other. Susan's still the only one with a surname.

Better to direct that resentment at old grudges, real or imagined; less problematic, at least, than taking it out on someone who shares the same flesh.

I realized something else, too. Surrounded by displays documenting the relentless growth of the leviathan beneath us, I could not only see why Sascha had objected to the word; I could also see why Isaac Szpindel, no doubt unconsciously, had spoken it in the first place.

As far as Earth was concerned, everyone on *Theseus* was an alter.

Sarasti stayed behind. He hadn't come with a backup.

There were the rest of us, though, crammed into the shuttle, embedded in custom spacesuits so padded with shielding we might have been deep-sea divers from a previous century. It was a fine balance; too much shielding would have been worse than none at all, would split primary particles into secondary ones, just as lethal and twice as numerous. Sometimes you had to live with moderate exposure; the only alternative was to embed yourself like a bug in lead.

We launched six hours from perigee. *Scylla* raced on ahead like an eager child, leaving its parent behind. There was no eagerness in the systems around me, though. Except for one: the Gang of Four almost *shimmered* behind her faceplate.

"Excited?" I asked.

Sascha answered: "Fuckin' *right*. *Field* work, Keeton. First contact."

"What if there's nobody there?" *What if there is, and they don't like us?*

"Even better. We get a crack at their signs and cereal boxes without their traffic cops leaning over our shoulders."

I wondered if she spoke for the others. I was pretty sure she didn't speak for Michelle.

Scylla's ports had all been sealed. There was no outside view, nothing to see inside but bots and bodies and the tangled silhouette swelling on my helmet HUD. But I could feel the radiation slicing through our armor as if it were tissue paper. I could feel the knotted crests and troughs of *Rorschach's* magnetic field. I could feel *Rorschach* itself, drawing nearer: the charred canopy of some firestormed alien forest, more landscape than artefact. I imagined titanic bolts of electricity arcing between its branches. I imagined getting in the way.

What kind of creatures would choose to live in such a place?

"You really think we'll get along," I said.

James' shrug was all but lost under the armor. "Maybe not at first. We may have gotten off on the wrong foot, we might have to sort through all kinds of misunderstandings. But we'll figure each other out eventually."

Evidently she thought that had answered my question.

The shuttle slewed; we bumped against each other like tenpins. Thirty seconds of micromanuevers brought us to a solid stop. A cheery animation played across the HUD in greens and blues: the shuttle's docking seal, easing through the membrane that served as our entrance into *Rorschach's* inflatable vestibule. Even as a cartoon it looked vaguely pornographic.

Bates had been prepacked next to the airlock. She slid back the inner door. "Everybody duck."

Not an easy maneuver, swaddled in life-support and ferroceramic. Helmets tilted and bumped. The grunts, flattened overhead like great lethal cockroaches, hummed to life and disengaged from the ceiling. They scraped past in the narrow headroom, bobbed cryptically to their mistress, and exited stage left.

Bates closed the inner hatch. The lock cycled, opened again on an empty chamber.

Everything nominal, according to the board. The drones waited patiently in the vestibule. Nothing had jumped out at them.

Bates followed them through.

We had to wait forever for the image. The baud rate was less than a trickle. Words moved back and forth easily enough—"No surprises so far," Bates reported in distorted Jews-harp vibrato—but any picture was worth a million of them, and—

There: through the eyes of the grunt behind we saw the grunt ahead in motionless, grainy monochrome. It was a postcard from the past: sight turned to sound, thick clumsy vibrations of methane bumping against the hull. It took long seconds for each static-ridden image to accrete on the HUD: grunts descending into the pit; grunts emerging into *Rorschach's* duodenum; a cryptic, hostile cavescape in systematic increments. Down in the lower left-hand corner of each image, timestamps and Teslas ran down the clock.

You give up a lot when you don't trust the EM spectrum.

"Looks good," Bates reported. "Going in."

In a friendlier universe machines would have cruised the

boulevard, sending perfect images in crystal resolution. Szpindel and the Gang would be sipping coffee back in the drum, telling the grunts to take a sample of this or get a close-up of that. In a friendlier universe, I wouldn't even be here.

Bates appeared in the next postcard, emerging from the fistula. In the next her back was to the camera, apparently panning the perimeter.

In the one after that she was looking right at us.

"Oh...okay," she said. "Come on...down..."

"Not so fast," Szpindel said. "How are you feeling?"

"Fine. A bit—odd, but..."

"Odd how?" Radiation sickness announced itself with nausea, but unless we'd seriously erred in our calculations that wouldn't happen for another hour or two. Not until well after we'd all been lethally cooked.

"Mild disorientation," Bates reported. "It's a bit spooky in here, but—must be Grey Syndrome. It's tolerable."

I looked at the Gang. The Gang looked at Szpindel. Szpindel shrugged.

"It's not gonna get any better," Bates said from afar. "The clock is... clock is ticking, people. Get down here."

We got.

Not living, not by a long shot.

Haunted.

Even when the walls didn't move, they did: always at the corner of the eye, that sense of crawling motion. Always at the back of the mind the sense of being *watched*, the dread certainty of malign and alien observers just out of sight. More than once I turned, expecting to catch one of those phantoms in the open. All I ever saw was a half-blind grunt floating down the passageway, or a wide-eyed and jittery crewmate returning my stare. And the walls of some glistening black lava tube with a hundred embedded eyes, all snapped shut just the instant

before. Our lights pushed the darkness back perhaps twenty meters in either direction; beyond, mist and shadows seethed. And the *sounds*—*Rorschach* creaked around us like some ancient wooden hull trapped in pack ice. Electricity hissed like rattlesnakes.

You tell yourself it's mostly in your head. You remind yourself it's well-documented, an inevitable consequence of meat and magnetism brought too close together. High-energy fields release the ghosts and the grays from your temporal lobe, dredge up paralyzing dread from the midbrain to saturate the conscious mind. They fuck with your motor nerves and make even dormant inlays sing like fine fragile crystal.

Energy artefacts. That's all they are. You repeat that to yourself, you repeat it so often it loses any pretense of rationality and devolves into rote incantation, a spell to ward off evil spirits. They're not real, these whispering voices just outside your helmet, those half-seen creatures flickering at the edge of vision. They're tricks of the mind, the same neurological smoke-and-mirrors that convinced people throughout the ages that they were being haunted by ghosts, abducted by aliens, hunted by—

—vampires—

—and you wonder whether Sarasti really stayed behind or if he was here all along, waiting for you...

"Another spike," Bates warned as *Tesla* and *Seiverts* surged on my HUD. "Hang on."

I was installing the Faraday bell. Trying to. It should have been simple enough; I'd already run the main anchor line down from the vestibule to the flaccid sack floating in the middle of the passageway. I was—that's right, something about a spring line. To, to keep the bell centered. The wall glistened in my headlamp like wet clay. Satanic runes sparkled in my imagination.

I jammed the spring line's pad against the wall. I could have sworn the substrate *flinched*. I fired my thrust pistol, retreated back to the center of the passage.

"They're here," James whispered.

Something was. I could feel it always behind me, no matter where I turned. I could feel some great roaring darkness swirling just out of sight, a ravenous *mouth* as wide as the tunnel itself. Any moment now it would lunge forward at impossible speed and engulf us all.

"They're *beautiful*..." James said. There was no fear in her voice at all. She sounded awestruck.

"What? Where?" Bates never stopped turning, kept trying to keep the whole three-sixty in sight at once. The drones under her command wobbled restlessly to either side, armored parentheses pointing down the passageway in opposite directions. "What do you see?"

"Not out *there*. In *here*. *Everywhere*. Can't you see it?"

"I can't see anything," Szpindel said, his voice shaking.

"It's in the EM fields," James said. "*That's* how they communicate. The whole structure is full of *language*, it's—"

"I can't see *anything*," Szpindel repeated. His breath echoed loud and fast over the link. "I'm *blind*."

"*Shit*." Bates swung on Szpindel. "How can that—the radiation —"

"I d-don't think that's it.."

Nine Tesla, and the ghosts were everywhere. I smelled asphalt and honeysuckle.

"Keeton!" Bates called. "You with us?"

"Y-yeah." Barely. I was back at the bell, my hand on the ripcord. Trying to ignore whatever kept tapping me on the shoulder.

"Leave that! Get him outside!"

"No!" Szpindel floated helplessly in the passage, his pistol bouncing against its wrist tether. "No, throw me something."

"What?"

It's all in your head. It's all in your—

"Throw something! Anything!"

Bates hesitated. "You said you were bli—"

"Just do it!"

Bates pulled a spare suit battery off her belt and lobbed it. Szpindel reached, fumbled. The battery slipped from his grasp

and bounced off the wall.

"I'll be okay," he gasped. "Just get me into the tent."

I yanked the cord. The bell inflated like a great gunmetal marshmallow.

"Everyone inside!" Bates ran her pistol with one hand, grabbed Szpindel with the other. She handed him off to me and slapped a sensor pod onto the skin of the tent. I pulled back the shielded entrance flap as though pulling a scab from a wound. The single molecule beneath, infinitely long, endlessly folded against itself, swirled and glistened like a soap bubble.

"Get him in. James! Get down here!"

I pushed Szpindel through the membrane. It split around him with airtight intimacy, hugged each tiny crack and contour as he passed through.

"James! Are you—"

"*Get it off me!*" Harsh voice, raw and scared and scary, as male as female could sound. Cruncher in control. "*Get it off!*"

I looked back. Susan James' body tumbled slowly in the tunnel, grasping its right leg with both hands.

"James!" Bates sailed over to the other woman. "Keeton! Help out!" She took the Gang by the arm. "Cruncher? What's the problem?"

"*That! You blind?*" He wasn't just *grasping* at the limb, I realized as I joined them. He was *tugging* at it. *He was trying to pull it off.*

Something laughed hysterically, right inside my helmet.

"Take his arm," Bates told me, taking his right one, trying to pry the fingers from their death grip on the Gang's leg. "Cruncher, *let go. Now.*"

"*Get it off me!*"

"It's your leg, Cruncher." We wrestled our way towards the diving bell.

"It's *not* my leg! Just *look* at it, how could it—it's *dead*. It's *stuck* to me..."

Almost there. "Cruncher, *listen*," Bates snapped. "Are you with m—"

"*Get it off!*"

We stuffed the Gang into the tent. Bates moved aside as I dove in after them. Amazing, the way she held it together. Somehow she kept the demons at bay, herded us to shelter like a border collie in a thunderstorm. She was—

She wasn't following us in. She wasn't even *there*. I turned to see her body floating outside the tent, one gloved hand grasping the edge of the flap; but even under all those layers of Kapton and Chromel and polycarbonate, even behind the distorted half-reflections on her faceplate, I could tell that something was missing. All her surfaces had just *disappeared*.

This couldn't be Amanda Bates. The thing before me had no more topology than a mannequin.

"Amanda?" The Gang gibbered at my back, softly hysterical.

Szpindel: "What's happening?"

"I'll stay out here," Bates said. She had no affect whatsoever. "I'm dead anyway."

"*Wha—*" Szpindel had lots. "You *will* be, if you don't—"

"You leave me here," Bates said. "That's an order."

She sealed us in.

It wasn't the first time, not for me. I'd had invisible fingers poking through my brain before, stirring up the muck, ripping open the scabs. It was far more intense when *Rorschach* did it to me, but Chelsea was more—

—precise, I guess you'd say.

Macramé, she called it: glial jumpstarts, cascade effects, the splice and dice of critical ganglia. While I trafficked in the reading of Human architecture, Chelsea *changed* it—finding the critical nodes and nudging them just so, dropping a pebble into some trickle at the headwaters of memory and watching the ripples build to a great rolling cascade deep in the downstream psyche. She could hotwire happiness in the time it took to fix a sandwich, reconcile you with your whole childhood in the course of a lunch hour or three.

Like so many other domains of human invention, this one had learned to run without her. Human nature was becoming an assembly-line edit, Humanity itself increasingly relegated from Production to product. Still. For me, Chelsea's skill set recast a strange old world in an entirely new light: the cut-and-paste of minds not for the greater good of some abstract society, but for the simple selfish wants of the individual.

"Let me give you the gift of happiness," she said.

"I'm already pretty happy."

"I'll make you happier. A TAT, on me."

"Tat?"

"Transient Attitudinal Tweak. I've still got privileges at Sax."

"I've been tweaked plenty. Change one more synapse and I might turn into someone else."

"That's ridiculous and you know it. Or every experience you had would turn you into a different person."

I thought about that. "Maybe it does."

But she wouldn't let it go, and even the strongest anti-happiness argument was bound to be an uphill proposition; so one afternoon Chelsea fished around in her cupboards and dredged up a hair-net studded with greasy gray washers. The net was a superconducting spiderweb, fine as mist, that mapped the fields of merest thought. The washers were ceramic magnets that bathed the brain in fields of their own. Chelsea's inlays linked to a base station that played with the interference patterns between the two.

"They used to need a machine the size of a bathroom just to house the magnets." She laid me back on the couch and stretched the mesh across my skull. "That's the only outright miracle you get with a portable setup like this. We can find hot spots, and we can even zap 'em if they need zapping, but TMS effects fade after a while. We'll have to go to a clinic for anything permanent."

"So we're fishing for what, exactly? Repressed memories?"

"No such thing." She grinned in toothy reassurance. "There are only memories we choose to ignore, or kinda think *around*, if you know what I mean."

"I thought this was the gift of happiness. Why—"

She laid a fingertip across my lips. "Believe it or not, Cyggers, people sometimes choose to ignore even *good* memories. Like, say, if they enjoyed something they didn't think they should. Or —" she kissed my forehead— "if they don't think they *deserve* to be happy."

"So we're going for—"

"Potluck. You can never tell 'til you get a bite. Close your eyes."

A soft hum started up somewhere between my ears. Chelsea's voice led me on through the darkness. "Now keep in mind, memories aren't historical archives. They're—improvisations, really. A lot of the stuff you associate with a particular event might be factually wrong, no matter how clearly you remember it. The brain has a funny habit of building composites. Inserting details after the fact. But that's not to say your memories aren't *true*, okay? They're an honest reflection of how you saw the world, and every one of them went into shaping how you *see* it. But they're not photographs. More like impressionist paintings. Okay?"

"Okay."

"Ah," she said. "There's something."

"What?"

"Functional cluster. Getting a lot of low-level use but not enough to intrude into conscious awareness. Let's just see what happens when we—"

And I was ten years old, and I was home early and I'd just let myself into the kitchen and the smell of burned butter and garlic hung in the air. Dad and Helen were fighting in the next room. The flip-top on our kitchen-catcher had been left up, which was sometimes enough to get Helen going all by itself. But they were fighting about something else; Helen *only wanted what was best for all of us* but Dad said *there were limits* and *this was not the way to go about it*. And Helen said *you don't know what it's like you hardly ever even see him* and then I knew they were fighting about me. Which in and of itself was nothing unusual.

What really scared me was that for the first time ever, Dad was fighting *back*.

"You do not *force* something like that onto someone. Especially without their knowledge." My father never shouted—his voice was as low and level as ever—but it was colder than I'd ever heard, and hard as iron.

"That's just *garbage*," Helen said. "Parents *always* make decisions for their children, in their best interests, especially when it comes to medical iss—"

"*This is not a medical issue.*" This time my father's voice *did* rise. "It's—"

"Not a medical issue! That's a new height of denial even for you! They cut out half his *brain* in case you missed it! Do you think he can recover from that without help? Is that more of your father's *tough love* shining through? Why not just deny him food and water while you're at it!"

"If mu-ops were called for they'd have been prescribed."

I felt my face scrunching at the unfamiliar word. Something small and white beckoned from the open garbage pail.

"Jim, be *reasonable*. He's so *distant*, he barely even *talks* to me."

"They said it would take time."

"But two years! There's nothing wrong with helping nature along a little, we're not even talking black market. It's over-the-counter, for God's sake!"

"That's not the point."

An empty pill bottle. That's what one of them had thrown out, before forgetting to close the lid. I salvaged it from the kitchen discards and sounded out the label in my head.

"Maybe the *point* should be that someone who's barely home three months of the year has got his bloody nerve passing judgment on *my* parenting skills. If you want a say in how he's raised, then you can damn well pay some dues first. Until then, just fuck right off."

"You will not put that shit into my son *ever again*," my father said.

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"Yeah? And how are you going to stop me, you little geek? You can't even make the time to find out what's going on in your own family; you think you can control me all the way from fucking orbit? You think—"

Suddenly, nothing came from the living room but soft choking sounds. I peeked around the corner.

My father had Helen by the throat.

"I think," he growled, "that I can stop you from doing anything to Siri ever again, if I have to. And I think you know that."

And then she saw me. And then he did. And my father took his hand from around my mother's neck, and his face was utterly unreadable.

But there was no mistaking the triumph on hers.

I was up off the couch, the skullcap clenched in one hand. Chelsea stood wide-eyed before me, the butterfly still as death on her cheekbone.

She took my hand. "Oh, God. I'm so sorry."

"You—you saw that?"

"No, of course not. It can't read minds. But that obviously—wasn't a happy memory."

"It wasn't all that bad."

I felt sharp, disembodied pain from somewhere nearby, like an ink spot on a white tablecloth. After a moment I fixed it: teeth in my lip.

She ran her hand up my arm. "It really stressed you out. Your vitals were—are you okay?"

"Yeah, of course. No big deal." Tasting salt. "I am curious

about something, though."

"Ask me."

"Why would you do this to me?"

"Because we can make it go *away*, Cygnus. That's the whole point. Whatever that was, whatever you didn't like about it, we know where it is now. We can go back in and damp it out just like *that*. And then we've got *days* to get it removed permanently, if that's what you want. Just put the cap back on and—"

She put her arms around me, drew me close. She smelled like sand, and sweat. I loved the way she smelled. For a while, I could feel a little bit safe. For a while I could feel like the bottom wasn't going to drop out at any moment. Somehow, when I was with Chelsea, I *mattered*.

I wanted her to hold me forever.

"I don't think so," I said.

"No?" She blinked, looked up at me. "Why ever *not*?"

I shrugged. "You know what they say about people who don't remember the past."

PREDATORS RUN FOR THEIR DINNER. PREY RUN FOR
THEIR LIVES.

—OLD ECOLOGIST'S PROVERB

WE WERE BLIND and helpless, jammed into a fragile bubble behind enemy lines. But finally the whisperers were silent. The monsters had stayed beyond the covers.

And Amanda Bates was out there with them.

"What the fuck," Szpindel breathed.

The eyes behind his faceplate were active and searching. "You can see?" I asked.

He nodded. "What happened to Bates? Her suit breach?"

"I don't think so."

"Then why'd she say she was dead? What—"

"She meant it *literally*," I told him. "Not *I'm as good as dead* or *I'm going to die*. She meant dead *now*. Like she was a talking corpse."

"How do—" *you know?* Stupid question. His face ticced and trembled in the helmet. "That's crazy, eh?"

"Define *crazy*."

The Gang floated quietly, cheek-to-jowl behind Szpindel in the cramped enclosure. Cruncher had stopped obsessing about the leg as soon as we'd sealed up. Or maybe he'd simply been overridden; I thought I saw facets of Susan in the twitching of those thick gloved fingers.

Szpindel's breath echoed second-hand over the link. "If Bates is dead, then so are we."

"Maybe not. We wait out the spike, we get out of here. Besides," I added, "she wasn't dead. She only said she was."

"Fuck," Szpindel reached out and pressed his gloved palm against the skin of the tent. He felt back and forth along the fabric. "Someone *did* put out a transducer—"

"Eight o'clock," I said. "About a meter." Szpindel's hand came to rest across the wall from the pod. My HUD flooded with second-hand numbers, vibrated down his arm and relayed to our suits.

Still five Tesla out there. Falling, though. The tent expanded around us as if breathing, shrank back in the next second as some transient low-pressure front moved past.

"When did your sight come back?" I wondered.

"Soon as we came inside."

"Sooner. You saw the battery."

"Fumbled it." He grunted. "Not that I'm much less of a spaz even when I'm *not* blind, eh? Bates! You out there?"

"You reached for it. You almost caught it. That wasn't blind chance."

"Not blind chance. *Blindsight*. Amanda? Respond, please."

"Blindsight?"

"Nothing wrong with the receptors," he said distractedly. "Brain processes the image but it can't access it. Brain stem

takes over."

"Your brainstem can see but you *can't*?"

"Something like that. Shut up and let me—Amanda, can you hear me?"

"...No..."

Not from anyone in the tent, that voice. It had shivered down Szpindel's arm, barely audible, with the rest of the data. From *outside*.

"Major Mandy!" Szpindel exclaimed. "You're alive!"

"...no..." A whisper like white noise.

"Well you're talking to us, so you sure as shit ain't *dead*."

"No..."

Szpindel and I exchanged looks. "What's the problem, Major?"
Silence. The Gang bumped gently against the wall behind us, all facets opaque.

"Major Bates? Can you hear me?"

"No." It was a dead voice— sedated, trapped in a fishbowl, transmitted through limbs and lead at a three-digit baud rate. But it was definitely Bates' voice.

"Major, you've got to get in here," Szpindel said. "Can you come inside?"

"...No..."

"Are you injured? Are you pinned by something?"

"..N—no."

Maybe not her voice, after all. Maybe just her vocal cords.

"Look. Amanda, it's dangerous. It's too damn hot out there, do you understand? You—"

"I'm not out here," said the voice.

"Where are you?"

"...nowhere."

I looked at Szpindel. Szpindel looked at me. Neither of us spoke.

James did. At long last, and softly: "And *what* are you, Amanda?"

No answer.

"Are you *Rorschach*?"

Here in the belly of the beast, it was so easy to believe.

"No..."

"Then what?"

"N...nothing." The voice was flat and mechanical. "I'm nothing."

"You're saying you don't exist?" Szpindel said slowly.

"Yes."

The tent breathed around us.

"Then how can you speak?" Susan asked the voice. "If you don't exist, what are we talking to?"

"Something...else." A sigh. A breath of static. "Not me."

"Shit," Szpindel muttered. His surfaces brightened with resolve and sudden insight. He pulled his hand from the wall; my HUD thinned instantly. "Her brain's frying. We gotta get her inside." He reached for the release.

I put out my own hand. "The spike—"

"Crested already, commissar. We're past the worst of it."

"Are you saying it's safe?"

"It's lethal. It's *always* lethal, and she's *out there* in it, and she could do some serious damage to herself in her pres—"

Something bumped the tent from the outside. Something grabbed the outer catch and *pulled*.

Our shelter opened like an eye. Amanda Bates looked in at us through the exposed membrane. "I'm reading three point eight," she said. "That's tolerable, right?"

Nobody moved.

"Come *on*, people. Break's over."

"Ama—" Szpindel stared. "Are you okay?"

"In here? Not likely. But we've got a job to do."

"Do you—exist?" I asked.

"What kind of stupid question is that? Szpindel, how's this field strength? Can we work in it?"

"Uh..." He swallowed audibly. "Maybe we should abort, Major. That spike was—"

"According to my readings, the spike is pretty much over. And we've got less than two hours to finish setting up, run our ground truths, and get out of here. Can we do that without hallucinating?"

"I don't think we'll shake the heebie-jeebies," Szpindel admitted. "But we shouldn't have to worry about —extreme effects— until another spike hits."

"Good."

"Which could be any time."

"We weren't hallucinating," James said quietly.

"We can discuss it later," Bates said. "Now—"

"There was a pattern there," James insisted. "In the fields. In my head. *Rorschach* was talking. Maybe not to us, but it was talking."

"Good." Bates pushed herself back to let us pass. "Maybe now we can finally learn to talk back."

"Maybe we can learn to *listen*," James said.

We fled like frightened children with brave faces. We left a base camp behind: Jack, still miraculously functional in its vestibule; a tunnel into the haunted mansion; forlorn magnetometers left to die in the faint hope they might not. Crude pyronometers and thermographs, antique radiation-proof devices that measured the world through the flex and stretch of metal tabs and etched their findings on rolls of plastic. Glow-globes and diving bells and guide ropes strung one to another. We left it all behind, and promised to return in thirty-six hours if we lived so long.

Inside each of us, infinitesimal lacerations were turning our cells to mush. Plasma membranes sprang countless leaks. Overwhelmed repair enzymes clung desperately to shredded genes and barely delayed the inevitable. Anxious to avoid the rush, patches of my intestinal lining began flaking away before the rest of the body had a chance to die.

By the time we docked with *Theseus* both Michelle and I were feeling nauseous. (The rest of the Gang, oddly, was not; I had no idea how that was possible.) The others would be presenting the same symptoms within minutes. Without intervention we

would all be vomiting our guts out for the following two days. Then the body would pretend to recover; for perhaps a week we would feel no pain and have no future. We would walk and talk and move like any living thing, and perhaps convince ourselves that we were immortal after all.

Then we would collapse into ourselves, rotted from the inside out. We would bleed from our eyes and mouths and assholes, and if any God was merciful we would die before splitting open like rotten fruit.

But of course *Theseus*, our redeemer, would save us from such a fate. We filed from the shuttle into a great balloon that Sarasti had erected to capture our personal effects; we shed our contaminated space suits and clothing and emerged naked into the spine. We passed single-file through the drum, the Flying Dead in formation. Jukka Sarasti—discreetly distant on the turning floor—leapt up in our wake and disappeared aft, to feed our radioactive cast-offs into the decompiler.

Into the crypt. Our coffins lay open across the rear bulkhead. We sank gratefully and wordlessly into their embrace. Bates coughed blood as the lids came down.

My bones hummed as the Captain began to shut me off. I went to sleep a dead man. I had only theory and the assurances of fellow machinery that I would ever be born again.

Keeton, come forth.

I woke up ravenous. Faint voices drifted forward from the drum. I floated in my pod for a few moments, eyes closed, savoring absences: no pain, no nausea. No terrifying subliminal sense of one's own body sloughing incrementally to mush. Weakness, and hunger; otherwise I felt fine.

I opened my eyes.

Something like an arm. Grey and glistening, far too— too *attenuate* to be human. No hand at its tip. Too many joints, a limb broken in a dozen places. It extended from a body barely

visible over the lip of the pod, a suggestion of dark bulk and other limbs in disjoint motion. It hovered motionless before me, as if startled in the midst of some shameful act.

By the time I had breath enough to cry out, it had whipped back out of sight.

I erupted from the pod, eyes everywhere. Now they saw nothing: an empty crypt, a naked note-taker. The mirrored bulkhead reflected vacant pods to either side. I called up ConSensus: all systems nominal.

It didn't reflect, I remembered. The mirror didn't show it.

I headed aft, heart still pounding. The drum opened around me, Szpindel and the Gang conversing in low tones aft. Szpindel glanced up and waved a trembling hand in greeting.

"You need to check me out," I called. My voice wasn't nearly so steady as I'd hoped.

"Admitting you have a problem is the first step," Szpindel called back. "Just don't expect miracles." He turned back to the Gang; James on top, they sat in a diagnostic couch staring at some test pattern shimmering on the rear bulkhead.

I grabbed the tip of a stairway and pulled myself down. Coriolis pushed me sideways like a flag in the breeze. "I'm either hallucinating or there's something on board."

"You're hallucinating."

"I'm *serious*."

"So am I. Take a number. Wait your turn."

He *was* serious. Once I forced myself to calm down and read the signs, I could see he wasn't even surprised.

"Guess you're pretty hungry after all that exhausting lying around, eh?" Szpindel waved at the galley. "Eat something. Be with you in a few minutes."

I forced myself to work up my latest synopsis while I ate, but that only took half a mind; the other still shivered in residual thrall to fight-flight. I tried to distract it by tapping the BioMed feed.

"It was *real*," James was saying. "We all saw it."

No. Couldn't have been.

Szpindel cleared his throat. "Try this one."

The feed showed what she saw: a small black triangle on a white background. In the next instant it shattered into a dozen identical copies, and a dozen dozen. The proliferating brood rotated around the center screen, geometric primitives ballroom-dancing in precise formation, each sprouting smaller triangles from its tips, fractalizing, rotating, *evolving* into an infinite, intricate tilework...

A sketchpad, I realized. An interactive eyewitness reconstruction, without the verbiage. Susan's own pattern-matching wetware reacted to what she saw— *no, there were more of them; no, the orientation's wrong; yes, that's it, but bigger*—and Szpindel's machine picked those reactions right out of her head and amended the display in realtime. It was a big step up from that half-assed workaround called *language*. The easily-impressed might have even called it mind-reading.

It wasn't, though. It was all just feedback and correlation. It doesn't take a telepath to turn one set of patterns into another. Fortunately.

"That's it! That's *it*!" Susan cried.

The triangles had iterated out of existence. Now the display was full of interlocking asymmetrical pentagrams, a spiderweb of fish scales.

"Don't tell us that's *random noise*," she said triumphantly.

"No," Szpindel said, "It's a Klüber constant."

"A—"

"It's a hallucination, Suze."

"Of *course*. But something *planted* it in our head, right? And —"

"It was in your head all along. It was in your head the day you were born."

"No."

"It's an artefact of deep brain structure. Even congenitally blind people see them sometimes."

"None of us have seen them before. *Ever*."

"I believe you. But there's no *information* there, eh? That wasn't *Rorschach* talking, it was just—interference. Like everything else."

"But it was so vivid! Not that flickering corner-of-your-eye stuff we saw everywhere. This was *solid*. It was realer than real."

"That's how you can tell it wasn't. Since you don't actually see it, there's no messy eyeball optics to limit resolution."

"Oh," James said, and then, softly: "Shit."

"Yeah. Sorry." And then, "Any time you're ready."

I looked up; Szpindel was waving me over. James rose from her chair, but it was Michelle who gave him a quick disconsolate squeeze and Sascha who grumbled past me on her way to their tent.

By the time I reached him Szpindel had unfolded the couch into a half-cot. "Lie down."

I did. "I wasn't talking about back in *Rorschach*, you know. I meant *here*. I saw something right now. When I woke up."

"Raise your left hand," he said. Then: "*Just* your left, eh?"

I lowered my right, winced at the pinprick. "That's a bit primitive."

He eyed the blood-filled cuvette between his thumb and forefinger: a shivering ruby teardrop the size of a fingernail. "Wet sample's still best for some things."

"Aren't the pods supposed to do everything?"

Szpindel nodded. "Call it a quality-control test. Keep the ship on its toes." He dropped the sample onto the nearest countertop. The teardrop flattened and burst; the surface drank my blood as if parched. Szpindel smacked his lips. "Elevated cholinesterase inhibitors in the ret. Yum."

For all I knew, my blood results actually *did* taste good to the man. Szpindel didn't just read results; he *felt* them, smelled and saw and *experienced* each datum like drops of citrus on the tongue. The whole BioMed subdrum was but a part of the Szpindel prosthesis: an extended body with dozens of different sensory modes, forced to talk to a brain that knew only five.

No wonder he'd bonded with Michelle. He was almost synestheliac himself.

"You spent a bit longer in there than the rest of us," he remarked.

"That's significant?"

A jerking shrug. "Maybe your organs got a bit more cooked than ours. Maybe you just got a delicate constitution. Your pod would've caught anything—imminent, so I figure—ah."

"What?"

"Some cells along your brainpan going into overdrive. More in your bladder and kidney."

"Tumors?"

"What you expect? *Rorschach's* no rejuve spa."

"But the pod—"

Szpindeł grimaced; his idea of a reassuring smile. "Repairs ninety-nine point nine percent of the damage, sure. By the time you get to the last zero-point-one, you're into diminishing returns. These're *small*, commissar. Chances are your own body'll take care of 'em. If not, we know where they live."

"The ones in my brain. Could they be causing—"

"Not a chance." He chewed on his lower lip for a moment.

"Course, cancer's not all that thing did to us."

"What I saw. Up in the crypt. It had these multijointed arms from a central mass. Big as a person, maybe."

Szpindeł nodded. "Get used to it."

"The others are seeing these things?"

"I doubt it. Everyone has a different take, like—" his twitching face conveyed *Dare I say it?* "*—Rorschach* blots."

"I was expecting hallucinations in the field," I admitted, "but up here?"

"TMS effects—" Szpindeł snapped his fingers— "they're *sticky*, eh? Neurons get kicked into one state, take a while to come unstuck. You never got a TAT? Well-adjusted boy like you?"

"Once or twice," I said. "Maybe."

"Same principle."

"So I'm going to keep seeing this stuff."

"Party line is they fade over time. Week or two you're back to normal. But out here, with *that* thing..." He shrugged. "Too many variables. Not the least of which is, I assume we'll keep going *back* until Sarasti says otherwise."

"But they're basically magnetic effects."

"Probably. Although I'm not betting on anything where *that* fucker's concerned."

"Could something else be causing them?" I asked. "Something on *this* ship?"

"Like what?"

"I don't know. Leakage in *Theseus'* magnetic shielding, maybe."

"Not normally. Course, we've all got little implanted networks in our heads, eh? And you've got a whole hemisphere of prosthetics up there, who knows what kind of *side-effects* those might let you in for. Why? *Rorschach* not a good enough reason for you?"

I saw them before, I might have said.

And then Szpindel would say *Oh, when? Where?*

And maybe I'd reply *When I was spying on your private life*, and any chance of *noninvasive observation* would be flushed down to the atoms.

"It's probably nothing. I've just been—jumpy lately. Thought I saw something weird in the spinal bundle, back before we landed on *Rorschach*. Just for a second, you know, and it disappeared as soon as I focused on it."

"Multijointed arms with a central mass?"

"God no. Just a flicker, really. If it was anything at all, it was probably just Amanda's rubber ball floating around up there."

"Probably." Szpindel seemed almost amused. "Couldn't hurt to check for leakage in the shielding, though. Just in case. Not like we need something *else* making us see things, eh?"

I shook my head at remembered nightmares. "How are the others?"

"Gang's fine, if a bit disappointed. Haven't seen the Major." He shrugged. "Maybe she's avoiding me."

"It hit her pretty hard."

"No worse than the rest of us, really. She might not even remember it."

"How—how could she possibly believe she didn't even *exist*?"

Szpindel shook his head. "Didn't believe it. *Knew* it. For a fact."

"But how—"

"Charge gauge on your car, right? Sometimes the contacts corrode. Readout freezes on empty, so you think it's empty. What else you supposed to think? Not like you can go in and count the electrons."

"You're saying the brain's got some kind of *existence gauge*?"

"Brain's got all *kinds* of gauges. You can *know* you're blind even when you're not; you can *know* you can see, even when you're blind. And yeah, you can *know* you don't exist even when you do. It's a long list, commissar. Cotard's, Anton's, Damascus Disease. Just for starters."

He hadn't said *blindsight*.

"What was it like?" I asked.

"Like?" Although he knew exactly what I meant.

"Did your arm— move by itself? When it reached for that battery?"

"Oh. Nah. You're still in control, you just—you get a feeling, is all. A *sense* of where to reach. One part of the brain playing charades with another, eh?" He gestured at the couch. "Get off. Seen enough of your ugly guts for now. And send up Bates if you can find where she's hiding. Probably back at Fab building a bigger army."

The misgivings glinted off him like sunlight. "You have a problem with her," I said.

He started to deny it, then remembered who he was talking to. "Not personally. Just—human node running mechanical infantry. Electronic reflexes slaved to meat reflexes. You tell me where the weak spot is."

"Down in *Rorschach*, I'd have to say *all* the links are pretty weak."

"Not talking about *Rorschach*," Szpindel said. "We go there. What stops them from coming here?"

"Them."

"Maybe they haven't arrived yet," he admitted. "But when they do, I'm betting we'll be going up against something bigger than anaerobic microbes." When I didn't answer he continued, his voice lowered. "And anyway, Mission Control didn't know

shit about *Rorschach*. They thought they were sending us some place where drones could do all the heavy lifting. But they just hate not being in command, eh? Can't admit the grunts're smarter than the generals. So our defenses get compromised for political appearances—not like *that's* any kinda news—and I'm no jarhead but it strikes me as real bad strategy."

I remembered Amanda Bates, midwifing the birth of her troops. *I'm more of a safety precaution....*

"Amanda—" I began.

"Like Mandy fine. Nice mammal. But if we're cruising into a combat situation I don't want my ass covered by some network held back by its weakest link."

"If you're going to be surrounded by a swarm of killer robots, maybe—"

"Yeah, people keep saying that. Can't trust the machines. Luddites love to go on about computer malfunctions, and how many accidental wars we might have prevented because a human had the final say. But funny thing, commissar; nobody talks about how many intentional wars got *started* for the same reason. You're still writing those postcards to posterity?"

I nodded, and didn't wince inwardly. It was just Szpindel.

"Well, feel free to stick this conversation in your next one. For all the good it'll do."

Imagine you are a prisoner of war.

You've got to admit you saw it coming. You've been crashing tech and seeding biosols for a solid eighteen months; that's a good run by anyone's standards. Realist saboteurs do not, as a rule, enjoy long careers. Everyone gets caught eventually.

It wasn't always thus. There was a day you might have even hoped for a peaceful retirement. But then they brought the vampires back from the Pleistocene and Great Grieving Ganga did *that* ever turn the balance of power upside down. Those fuckers are always ten steps ahead. It only makes sense; after

all, hunting people is what bloodsuckers evolved to *do*.

There's this line from an early pop-dyn textbook, really old, maybe even TwenGen. It's something of a mantra—maybe *prayer* would be a better word—among those in your profession. *Predators run for their dinner*, it goes. *Prey run for their lives*. The moral is supposed to be that on average, the hunted escape the hunters because they're more motivated.

Maybe that was true when it all just came down to who ran faster. Doesn't seem to hold when the strategy involves tactical foresight and double-reverse mind fucks, though. The vampires win every time.

And now you're caught, and while it may have been vampires that set the trap, it was regular turncoat baseline humans who pulled the trigger. For six hours now you've been geckoed to the wall of some unnamed unlisted underground detention facility, watching as some of those selfsame *humans* played games with your boyfriend and co-conspirator. These are not your average games. They involve pliers, and glowing wires, and body parts that were not designed to detach. You wish, by now, that your lover were dead, like the two others in your cell whose parts are scattered about the room. But they're not letting that happen. They're having too much fun.

That's what it all comes down to. This is not an interrogation; there are less invasive ways to get more reliable answers. These are simply a few more sadistic thugs with Authority, killing time and other things, and you can only cry and squeeze your eyes tight and whimper like an animal even though they haven't laid a hand on you yet. You can only wish they hadn't saved you for last, because you know what that means.

But suddenly your tormentors stop in mid-game and cock their heads as if listening to some collective inner voice. Presumably it tells them to take you off the wall, bring you into the next room, and sit you down at one of two gel-padded chairs on opposite sides of a smart desk, because this is what they do—far more gently than you'd expect—before retiring. You can also assume that whoever has given these instructions is both powerful and displeased, because all the arrogant

sadistic cockiness has drained from their faces in the space of a heartbeat.

You sit and wait. The table glows with soft, cryptic symbols that would be of no earthly interest to you even if you could understand them, even if they contained the very secret of the vampires themselves. Some small part of you wonders if this latest development might be cause for hope; the rest of you doesn't dare believe it. You hate yourself for caring about your own survival when chunks of your friends and allies are still warm on the other side of the wall.

A stocky Amerind woman appears in the room with you, clad in nondescript military weave. Her hair is buzzed short, her throat veined with the faint mesh of a sub-q antennae. Your brain stem sees that she is ten meters tall, even though some impertinent gelatinous overlay insists that she is of only average height.

The name tag on her left breast says *Bates*. You see no sign of rank.

Bates extracts a weapon from its sheath on her thigh. You flinch, but she does not point it at you. She sets it on the desk, easily within your reach, and sits across from you.

A microwave pistol. Fully charged, unlocked. On its lowest setting it causes sunburn and nausea. On its highest it flash-boils brains in the skull. At any setting between, it inflicts pain and injury in increments as fine as your imagination.

Your imagination has been retooled for great sensitivity along such scales. You stare numbly at the gun, trying to figure the trick.

"Two of your friends are dead," Bates says, as though you haven't just watched them die. "Irrecoverably so."

Irrecoverably dead. Good one.

"We could reconstitute the bodies, but the brain damage..." Bates clears her throat as if uncomfortable, as if embarrassed. It's a surprisingly human gesture for a monster. "We're trying to save the other one. No promises.

"We need information," she says, cutting to the chase.

Of course. What came before was psychology, softening-up.

Bates is the good cop.

"I've got nothing to tell you," you manage. It's ten percent defiance, ninety percent deduction: they wouldn't have been able to catch you in the first place unless they already knew everything.

"Then we need an arrangement," Bates says. "We need to come to some kind of accommodation."

She has to be kidding.

Your incredulity must be showing. Bates addresses it: "I'm not completely unsympathetic. My gut doesn't much like the idea of swapping reality for simulation, and it doesn't buy that what-is-truth spin the Body Economic sells to get around it. Maybe there's reason to be scared. Not my problem, not my job, just my opinion and it could be wrong. But if we kill each other in the meantime, we don't find out either way. It's unproductive."

You see the dismembered bodies of your friends. You see pieces on the floor, still a little bit alive, and this cunt has the nerve to talk about *productivity*?

"We didn't start it," you say.

"I don't know and I don't care. Like I said, it's not my job." Bates jerks a thumb over her shoulder at a door in the wall behind her, the door she must have entered through. "In there," she says, "are the ones who killed your friends. They've been disarmed. When you go through that door the room will go offline and remain unmonitored for a period of sixty seconds. Nobody besides yourself will ever hold you accountable for whatever happens in there during that time."

It's a trick. It has to be.

"What do you have to lose?" Bates wonders. "We can already do anything we want to you. It's not like we need you to give us an excuse."

Hesitantly, you take the gun. Bates doesn't stop you.

She's right, you realize. You have absolutely nothing to lose. You stand and, suddenly fearless, point the weapon at her face. "Why go in there? I can kill you right *here*."

She shrugs. "You could try. Waste of an opportunity, if you ask me."

"So I go in there, and I come out in sixty seconds, and then what?"

"Then we talk."

"We just—"

"Think of it as a gesture of good faith," she says. "Restitution, even."

The door opens at your approach, closes in your wake. And there they are, all four of them, spread up across the wall like a chorus line of Christs on crosses. There's no gleam in those eyes *now*. There's only a bright animal terror and the reflection of turned tables. Two of the Christs stain their pants when you look them in the eye.

What's left? Maybe fifty seconds?

It's not a lot. You could have done so much more with just a little extra time. But it's enough, and you don't want to impose on the good graces of this Bates woman.

Because she may at last be someone you can deal with.

Under other circumstances, Lieutenant Amanda Bates would have been court-martialed and executed within the month. No matter that the four who'd died had been guilty of multiple counts of rape, torture, and homicide; that's just what people *did* in wartime. It's what they'd always done. There was nothing *polite* about war, no honorable code beyond the chain of command and the circling of wagons. Deal with indiscretions if you must; punish the guilty if you have to, for appearance if nothing else. But for God's sake close the doors first. Never give your enemy the satisfaction of seeing discord in the ranks, show them nothing but unity and flinty-eyed resolve. There may be murderers and rapists in our midst, but by God they're *our* murderers and rapists.

You certainly don't give right of revenge to some terrorist twat with over a hundred friendly scalps on her belt.

Still, it was hard to argue with results: a negotiated ceasefire

with the third-largest Realist franchise in the hemisphere. An immediate forty-six percent decline in terrorist activities throughout the affected territories. The unconditional cancellation of several in-progress campaigns which could have seriously compromised three major catacombs and taken out the Duluth Staging Grounds entirely. All because Lieutenant Amanda Bates, feeling her way through her first field command, had gambled on *empathy* as a military strategy.

It was collaborating with the enemy, it was treason, it was betrayal of the rank and file. Diplomats and politicians were supposed to do those things, not soldiers.

Still. Results.

It was all there in the record: initiative, creativity, a willingness to succeed by whatever means necessary and at whatever cost. Perhaps those inclinations needed to be punished, perhaps only tempered. The debate might have gone on forever if the story hadn't leaked—but it had, and suddenly the generals had a hero on their hands.

Sometime during her court-martial, Bates's death sentence turned into a rehabilitation; the only question was whether it would take place in the stockade or Officer's College. As it turned out, Leavenworth had both; it took her to its bosom and squeezed hard enough to virtually guarantee promotion, if it didn't kill her first. Three years later Major Bates was bound for the stars, where she was heard to say

We're breaking and entering, Siri...

Szpindel was not the first to register doubts. Others had wondered whether her assignment owed as much to superior qualifications as it did to the resolution of inconvenient PR. I, of course, had no opinion one way or the other; but I could see how she might strike some as a double-edged sword.

When the fate of the world hangs in the balance, you want to keep an eye on anyone whose career-defining moment involves consorting with the enemy.

IF YOU CAN SEE IT, CHANCES ARE IT DOESN'T EXIST.

—KATE KEOGH, *GROUNDS FOR SUICIDE*

FIVE TIMES WE did it. Over five consecutive orbits we threw ourselves between the monster's jaws, let it chew at us with a trillion microscopic teeth until *Theseus* reeled us in and stitched us back together. We crept through *Rorschach's* belly in fits and starts, focusing as best we could on the tasks at hand, trying to ignore the ghosts that tickled our midbrains. Sometimes the walls flexed subtly around us. Sometimes we only thought they did. Sometimes we took refuge in our diving bell while waves of charge and magnetism spiraled languidly past, like boluses of ectoplasm coursing down the intestine of some poltergeist god.

Sometimes we got caught in the open. The Gang would squabble amongst itself, uncertain which persona was which. Once I fell into a kind of waking paralysis while alien hands dragged me away down the hall; fortunately other hands brought me home, and voices that claimed to be real told me I'd made the whole thing up. Twice Amanda Bates found God, saw the fucker right there in front of her, knew beyond any shadow of a doubt that the creator not only existed but *spoke* to her, and her alone. Both times she lost her faith once we got her into the bell, but it was touch and go for a while; her warrior drones, drunk on power but still under line-of-sight control, staggered from their perimeters and pointed their weapons along bearings too close for comfort.

The grunts died fast. Some barely lasted a single foray; a few died in minutes. The longest-lived were the slowest on the draw, half-blind, thick-witted, every command and response bottlenecked by raw high-frequency sound buzzing across their shielded eardrums. Sometimes we backed them up with others that spoke optically: faster but nervous, and even more vulnerable. Together they guarded against an opposition that had not yet shown its face.

It hardly had to. Our troops fell even in the absence of enemy fire.

We worked through it all, through fits and hallucinations and occasional convulsions. We tried to watch each others' backs while magnetic tendrils tugged our inner ears and made us seasick. Sometimes we vomited into our helmets; then we'd just hang on, white-faced, sucking sour air through clenched teeth while the recyclers filtered chunks and blobs from our headspace. And we'd give silent thanks for the small mercy of nonstick, static-repellent faceplates.

It rapidly became obvious that my presence served as more than cannon fodder. It didn't matter that I lacked the Gang's linguistic skills or Szpindel's expertise in biology; I was another set of hands, in a place where anyone could be laid out at a moment's notice. The more people Sarasti kept in the field, the greater the odds that at least one of them would be halfway functional at any given moment. Even so, we were in barely any condition to accomplish anything. Every incursion was an exercise in reckless endangerment.

We did it anyway. It was that or go home.

The work proceeded in infinitesimal increments, hamstrung on every front. The Gang wasn't finding any evidence of signage or speech to decipher, but the gross mechanics of this thing were easy enough to observe. Sometimes *Rorschach* partitioned itself, extruded ridges around its passageways like the cartilaginous hoops encircling a human trachea. Over hours some of them might develop into contracting irises, into complete septa, lazy as warm candle wax. We seemed to be witnessing the growth of the structure in discrete segments. *Rorschach* grew mainly from the tips of its thorns; we'd made our incursion hundreds of meters from the nearest, but evidently the process extended at least this far back.

If it *was* part of the normal growth process, though, it was a feeble echo of what must have been going on in the heart of the apical zones. We couldn't observe those directly, not from inside; barely a hundred meters towards the thorn the tube grew too lethal even for suicidal flesh. But over those five orbits *Rorschach* grew by another eight percent, as mindless and mechanical as a growing crystal.

Through it all I tried to do my job. I compiled and collated, massaged data I would never understand. I watched the systems around me as best I could, factored each tic and trait into the mix. One part of my mind produced synopses and syntheses while another watched, incredulous and uncomprehending. Neither part could trace where those insights had come from.

It was difficult, though. Sarasti wouldn't let me back outside the system. Every observation was contaminated by my own confounding presence in the mix. I did my best. I made no suggestions that might affect critical decisions. In the field I did what I was told to, and no more. I tried to be like one of Bates's drones, a simple tool with no initiative and no influence on the group dynamic. I think I pulled it off, for the most part.

My nonsights accumulated on schedule and piled up in *Theseus's* transmission stack, unsent. There was too much local interference to get a signal through to Earth.

Szpendel was right: the ghosts followed us back. We began to hear voices other than Sarasti's, whispering up the spine. Sometimes even the brightly-lit wraparound world of the drum would warp and jiggle from the corner of my eye—and more than once I saw boney headless phantoms with too many arms, nested in the scaffolding. They seemed solid enough from the corner of my eye but any spot I focused on faded to shadow, to a dark translucent stain against the background. They were so very fragile, these ghosts. The mere act of observation drilled holes through them.

Szpendel had rattled off dementias like raindrops. I went to ConSensus for enlightenment and found a whole other self buried below the limbic system, below the hindbrain, below even the cerebellum. It lived in the brain stem and it was older than the vertebrates themselves. It was self-contained: it heard and saw and felt, independent of all those other parts layered overtop like evolutionary afterthoughts. It dwelt on nothing but

its own survival. It had no time for planning or abstract analysis, spared effort for only the most rudimentary sensory processing. But it was *fast*, and it was dedicated, and it could react to threats in a fraction of the time it took its smarter roommates to even become *aware* of them.

And even when it couldn't—when the obstinate, unyielding neocortex refused to let it off the leash—still it tried to pass on what it saw, and Isaac Szpindel experienced an ineffable sense of *where to reach*. In a way, he had a stripped-down version of the Gang in his head. Everyone did.

I looked further and found God Itself in the meat of the brain, found the static that had sent Bates into rapture and Michelle into convulsions. I tracked Gray Syndrome to its headwaters in the temporal lobe. I heard voices ranting in the brains of schizophrenics. I found cortical infarcts that inspired people to reject their own limbs, imagined the magnetic fields that must have acted in their stead when Cruncher tried to dismember himself. And off in some half-forgotten pesthole of Twentieth-century case studies—filed under *Cotard's Syndrome*—I found Amanda Bates and others of her kind, their brains torqued into denial of the very self. "I used to have a heart," one of them said listlessly from the archives. "Now I have something that beats in its place." Another demanded to be buried, because his corpse was already stinking.

There was more, a whole catalog of finely-tuned dysfunctions that *Rorschach* had not yet inflicted on us. Somnambulism. Agnosias. Hemineglect. ConSensus served up a freak show to make any mind reel at its own fragility: a woman dying of thirst within easy reach of water, not because she couldn't see the faucet but because she couldn't *recognize* it. A man for whom the left side of the universe did not exist, who could neither perceive nor *conceive* of the left side of his body, of a room, of a line of text. A man for whom the very concept of *leftness* had become literally unthinkable.

Sometimes we could conceive of things and still not see them, although they stood right before us. Skyscrapers appeared out of thin air, the person talking to us changed into someone else

during a momentary distraction— and we didn't notice. It wasn't magic. It was barely even misdirection. They called it *inattentional blindness*, and it had been well-known for a century or more: a tendency for the eye to simply *not notice* things that evolutionary experience classed as *unlikely*.

I found the opposite of Szpindel's *blindsight*, a malady not in which the sighted believe they are blind but one in which *the blind insist they can see*. The very idea was absurd unto insanity and yet there they were, retinas detached, optic nerves burned away, any possibility of vision denied by the laws of physics: bumping into walls, tripping over furniture, inventing endless ludicrous explanations for their clumsiness. The lights, unexpectedly turned off by some other party. A colorful bird glimpsed through the window, distracting attention from the obstacle ahead. I can see perfectly well, thank you. Nothing wrong with *my eyes*.

Gauges in the head, Szpindel had called them. But there were other things in there too. There was a model of the world, and we didn't look *outward* at all; our conscious selves saw only the simulation in our heads, an *interpretation* of reality, endlessly refreshed by input from the senses. What happens when those senses go dark, but the model—thrown off-kilter by some trauma or tumor—*fails to refresh*? How long do we stare in at that obsolete rendering, recycling and massaging the same old data in a desperate, subconscious act of utterly honest denial? How long before it dawns on us that the world we see no longer reflects the world we inhabit, that we are *blind*?

Months sometimes, according to the case files. For one poor woman, a year and more.

Appeals to logic fail utterly. How could you see the bird when there *is* no window? How do you decide where your seen half-world ends if you can't see the other half to weigh it against? If you are dead, how can you smell your own corruption? If you do not exist, Amanda, *what is talking to us now*?

Useless. When you're in the grip of Cotard's Syndrome or hemineglect you cannot be swayed by argument. When you're

in thrall to some alien artefact you *know* that the self is gone, that reality ends at the midline. You know it with the same unshakeable certainty of any man regarding the location of his own limbs, with that hardwired awareness that needs no other confirmation. Against that conviction, what is reason? What is logic?

Inside *Rorschach*, they had no place at all.

On the sixth orbit it acted.

"It's talking to us," James said. Her eyes were wide behind the faceplate, but not bright, not manic. Around us *Rorschach's* guts oozed and crawled at the corner of my eye; it still took effort to ignore the illusion. Foreign words scrabbled like small animals below my brainstem as I tried to focus on a ring of finger-sized protrusions that picketed a patch of wall.

"It's not talking," Szpindel said from across the artery. "You're hallucinating again."

Bates said nothing. Two grunts hovered in the middle of the space, panning across three axes.

"It's different this time," James insisted. "The geometry—it's not so symmetrical. Looks almost like the Phaistos disk." She spun slowly, pointed down the passage: "I think it's stronger down here..."

"Bring Michelle out," Szpindel suggested. "Maybe she can talk some sense into you."

James laughed weakly. "Never say die, do you?" She tweaked her pistol and coasted into deeper gloom. "Yes, it's definitely stronger here. There's *content*, superimposed on—"

Quick as a blink, *Rorschach* cut her off.

I'd never seen anything move so fast before. There was none of the languor we'd grown accustomed to from *Rorschach's* septa, no lazy drift to contraction; the iris snapped shut in an instant. Suddenly the artery just *ended* three meters ahead, with a matte-black membrane filigreed in fine spiral.

And the Gang of Four was on the other side.

The grunts were on it immediately, lasers crackling through the air. Bates was yelling *Get behind me! Stick to the walls!*, kicking herself into space like an acrobat in fast-forward, taking some tactical high ground that must have been obvious to her, at least. I edged towards the perimeter. Threads of superheated plasma sliced the air, shimmering. Szpindel, at the corner of my eye, hugged the opposite side of the tunnel. The walls crawled. I could see the lasers taking a toll; the septum peeled back from their touch like burning paper, black oily smoke writhing from its crisping edges and—

Sudden brightness, everywhere. A riot of fractured light flooded the artery, a thousand shifting angles of incidence and reflection. It was like being trapped in the belly of a kaleidoscope, pointed at the sun. Light—

—and needle-sharp pain in my side, in my left arm. The smell of charred meat. A scream, cut off.

Susan? You there, Susan?

We're taking you first.

Around me, the light died; inside me, a swarm of floaters mixed it up with the chronic half-visions *Rorschach* had already planted in my head. Alarms chirped irritatingly in my helmet—*breach, breach, breach*—until the smart fabric of the suit softened and congealed where the holes had been. Something stung maddeningly in my left side. I felt as if I'd been branded.

"Keeton! Check Szpindel!" Bates had called off the lasers. The grunts closed for hand-to-hand, reaching with fiery nozzles and diamond-tipped claws to grapple with some prismatic material glowing softly *behind* that burnt-back skin.

Fibrous reflector, I realized. It had shattered the laser light, turned it to luminous shrapnel and thrown it back in our faces. Clever.

But its surface was still alight, even with the lasers down; a diffuse glow, dipping and weaving, filtered through from the far side of the barrier while the drones chewed doggedly through the near one. After a moment it struck me: James's headlamp.

"Keeton!"

Right. Szpindel.

His faceplate was intact. The laser had melted the Faraday mesh laminated onto the crystal, but the suit was sealing that tiny hole even now. The hole behind, drilled neatly through his forehead, remained. The eyes beneath stared at infinity.

"Well?" Bates asked. She could read his vitals as easily as I, but *Theseus* was capable of post-mortem rebuilds.

Barring brain damage. "No."

The whine of drills and shredders stopped; the ambience brightened. I looked away from Szpindel's remains. The grunts had cut a hole in the septum's fibrous underlayer. One of them nosed its way through to the other side.

A new sound rose into the mix, a soft animal keening, haunted and dissonant. For a moment I thought *Rorschach* was whispering to us again; its walls seemed to contract slightly around me.

"James?" Bates snapped. "*James!*"

Not James. A little girl in a woman's body in an armored spacesuit, scared out of her wits.

The grunt nudged her curled-up body back into our company. Bates took it gently. "Susan? Come back, Suze. You're safe."

The grunts hovered restlessly, alert in every direction, pretending everything was under control. Bates spared me a glance—"Take Isaac."—and turned back to James. "Susan?"

"N—n-no," whimpered a small voice, a little girl's voice.

"Michelle? Is that you?"

"There was a *thing*," the little girl said. "It *grabbed* me. It grabbed my *leg*."

"We're out of here." Bates pulled the Gang back along the passage. One grunt lingered, watching the hole; the other took point.

"It's gone," Bates said gently. "There's nothing there now. See the feed?"

"You can't s-see it." Michelle whispered. "It's in—it's in—*visible*.."

The septum receded around a curve as we retreated. The hole

torn through its center watched us like the ragged pupil of some great unblinking eye. It stayed empty as long as it stayed in sight. Nothing came out after us. Nothing we could see. A thought began cycling through my head, some half-assed eulogy stolen from an eavesdropped confessional, and try as I might I couldn't shut it down.

Isaac Szpindel hadn't made the semifinals after all.

Susan James came back to us on the way up. Isaac Szpindel did not.

We stripped wordlessly in the decon balloon. Bates, first out of her suit, reached for Szpindel but the Gang stopped her with a hand and a headshake. Personae segued one into another as they stripped the body. Susan removed helmet and backpack and breastplate. Cruncher peeled away the silvery leaded skin from collar to toe. Sascha stripped the jumpsuit and left the pale flesh naked and exposed. Except for the gloves. They left his feedback gloves in place; their fingertips forever tactile, the flesh inside forever numb. Through it all, Szpindel stared unblinking beneath the hole in his forehead. His glazed eyes focused on distant quasars.

I expected Michelle to appear in her turn and close them, but she never did.

YOU HAVE EYES, BUT YOU DO NOT SEE.

—JESUS THE NAZOREAN

I DON'T KNOW how to feel about this, I thought. He was a good man. He was decent, he was kind to me, even when he didn't know I was listening in. I didn't know him long— he wasn't a friend exactly — but still. I should miss him. I should mourn.

I should feel more than this sick sinking fear that I could be next...

Sarasti hadn't wasted any time. Szpindel's replacement met us as we emerged, freshly thawed, nicotine-scented. The rehydration of his flesh was ongoing—saline bladders clung to each thigh—although it would never entirely erase the sharpness of his features. His bones cracked when he moved.

He looked past me and took the body. "Susan—Michelle...I—" The gang turned away.

He coughed, began fumbling a body condom over the corpse. "Sarasti wants everyone in the drum."

"We're hot," Bates said. Even cut short, the excursion had piled up a lethal Seivert count. Faint nausea tickled the back of my throat.

"Decontaminate later." One long pull of a zipper and Szpindel was gone, engulfed in an oily gray shroud. "You—" he turned in my direction, pointed at the scorched holes in my jumpsuit. "With me."

Robert Cunningham. Another prototype. Dark-haired, hollow-cheeked, a jaw you could use as a ruler. Both smoother and harsher than the man he had replaced. Where Szpindel had ticced and jerked as if static-charged, Cunningham's face held all the expression of a wax dummy's. The wetware that ran those muscles had been press-ganged into other pursuits. Even the tremors that afflicted the rest of his body were muted, soothed by the nicotine he drew with every second breath.

He held no cigarette now. He held only the shrouded body of his hard-luck primary and his ongoing, freshly thawed distaste for the ship's synthesist. His fingers trembled.

Bates and the Gang moved silently up the spine. Cunningham and I followed, guiding the Shroud of Szpindel between us. My leg and side were stinging again, now that Cunningham had reminded them to. There wouldn't be much he could do about them, though. The beams would have cauterized the flesh on their way through, and if they'd hit anything vital I'd have been dead already.

At the hatch we broke into single-file: Szpindel first,

Cunningham pushing at his heels. By the time I emerged into the drum Bates and the gang were already down on deck and taking their usual seats. Sarasti, in the flesh, watched them from the end of the conference table.

His eyes were naked. From this angle the soft, full-spectrum light of the drum washed the shine from them. If you didn't look too closely, for too long, you might almost think those eyes were Human.

BioMed had been spun down for my arrival. Cunningham pointed to a diagnostic couch on a section of the stilled deck that served as our infirmary; I floated over and strapped myself in. Two meters away, past a waist-high guard rail that had risen from the deck, the rest of the drum rolled smoothly past. It slung Bates and the Gang and Sarasti around like weights on a string.

I tapped ConSensus to hear them. James was speaking, quietly and without expression. "I noticed a new pattern in the form-constants. Something in the grating. It looked like a signal. It got stronger as I went down the tunnel, I followed it, I blacked out. I don't remember anything more until we were on our way back. Michelle filled me in, as much as she could. That's all I know. I'm sorry."

A hundred degrees away in the no-gee zone, Cunningham maneuvered his predecessor into a coffin with different options than those up front. I wondered if it would embark on an autopsy during the debriefing. I wondered if we'd be able to hear the sounds it made.

"Sascha," Sarasti said.

"Yeah." Sascha's trademark drawl infected the voice. "I was riding Mom. Went deaf dumb and stark fucking blind when she passed out. I tried to take over but something was blocking me. Michelle, I guess. Never thought she had it in her. I couldn't even see."

"But you don't lose consciousness."

"I was awake the whole time, far as I know. Just completely in the dark."

"Smell? Tactile?"

"I could feel it when Michelle pissed in the suit. But I didn't notice anything else."

Cunningham was back at my side. The inevitable cigarette had appeared between his lips.

"Nothing touches you," the vampire surmised. "Nothing grabs your leg."

"No," Sascha said. She didn't believe Michelle's stories about invisible monsters. None of us did; why bother, when dementia could so easily explain anything we experienced?

"Cruncher."

"Don't know anything," I still wasn't used to the maleness of the voice now emanating from James's throat. Cruncher was a workaholic. He hardly ever surfaced in mixed company.

"You're there," Sarasti reminded him. "You must remember some—"

"Mom sent me patterns to parse. I was working on them. I'm *still* working on them," he added pointedly. "I didn't notice anything. Is that all?"

I'd never been able to get a good read on him. Sometimes Cruncher seemed to have more in common with the dozens of nonconscious modules working in James's head than with sentient hubs comprising the rest of the Gang. "You feel nothing?" Sarasti pressed.

"Just the patterns."

"Anything significant?"

"Standard phenomath spirals and gratings. But I haven't finished. Can I go now?"

"Yes. Call Michelle, please."

Cunningham stabbed at my wounds with anabolisers, muttering to himself. Faint blue smoke curled between us. "Isaac found some tumors," he observed.

I nodded and coughed. My throat was sore. The nausea had grown heavy enough to sink below my diaphragm.

"Michelle." Sarasti repeated.

"I see some more here," Cunningham continued. "Along the bottom of your brain pan. Only a few dozen cells so far, they're not worth burning yet."

"Here." Michelle's voice was barely audible, even through ConSensus, but at least it was the voice of an adult. "I'm here."

"What do you remember, please?"

"I—I felt—I was just riding Mom, and then she was gone and there was no one else, so I had to—take over..."

"Do you see the septum close?"

"Not really. I felt it going dark, but when I turned around we were already trapped. And then I felt something behind me, it wasn't loud or harsh it just sort of *bumped*, and it grabbed me, and—and—

"I'm sorry," she said after a moment. "I'm a bit—woozy..."

Sarasti waited.

"Isaac," Michelle whispered. "He..."

"Yes." A pause. "We're very sorry about that."

"Maybe—can he be fixed?"

"No. There's brain damage." There was something like sympathy in the vampire's voice, the practiced affectation of an accomplished mimic. There was something else, too, an all-but-imperceptible hunger, a subtle edge of *temptation*. I don't think anyone heard it but me.

We were sick, and getting sicker. Predators are drawn to the weak and injured.

Michelle had fallen silent again. When she continued, her voice only faltered a little: "I can't tell you much. It grabbed me. It let me go. I went to pieces, and I can't explain why except that fucking place just *does* things to you, and I was—weak. I'm sorry. There's not much else to tell you."

"Thank you," Sarasti said after a long moment.

"Can I—I'd like to leave if that's okay."

"Yes," Sarasti said. Michelle sank below the surface as the Commons rotated past. I didn't see who took her place.

"The grunts didn't see anything," Bates remarked. "By the time we broke through the septum the tunnel behind was empty."

"Any bogey would have had plenty of time to hightail," Cunningham said. He planted his feet on the deck and grabbed a handhold; the subdrum began to move. I drifted obliquely

against my restraints.

"I don't disagree," Bates said, "But if there's anything we've learned about that place, it's that we can't trust our senses."

"Trust Michelle's," Sarasti said. He opened a window as I grew heavier: a grunt's-eye view of a fuzzy, bright blob weaving behind the translucent waxed-paper fibers of the skinned septum. James's headlight, from the wrong side of the barrier. The image wobbled a bit as the drone staggered through some local pocket of magnetism, then replayed. Wobbled, replayed. A six-second loop.

"See something next to the Gang."

Non-vampires saw no such thing. Sarasti froze the image, evidently realizing as much. "Diffraction patterns aren't consistent with a single light source in open space. I see dimmer elements, reflective elements. Two dark objects close together, similar size, scattering light here—" a cursor appeared at two utterly nondescript points on the image— "and here. One's the Gang. The other's unaccounted for."

"Just a minute," Cunningham said. "If *you* can see it through all that, why didn't Su—why didn't *Michelle* see anything?"

"Synestheliac," Sarasti reminded him. "You see. She *feels*."

BioMed jerked slightly, locking into spin-synch with the drum; the guard rail sank back into the deck. Off in some far-off corner, something without eyes watched me watching it.

"Shit," Bates whispered. "There's someone home."

They never really talked like that, by the way. You'd hear gibberish—a half-dozen languages, a whole Babel of personal idioms—if I spoke in their real voices.

Some of the simpler tics make it through: Sascha's good-natured belligerence, Sarasti's aversion to the past tense. Cunningham lost most of his gender pronouns to an unforeseen glitch during the work on his temporal lobe. But it went beyond that. The whole lot of them threw English and Hindi and

Hadzane into every second sentence; no real scientist would allow their thoughts to be hamstrung by the conceptual limitations of a single language. Other times they acted almost as synthesists in their own right, conversing in grunts and gestures that would be meaningless to any baseline. It's not so much that the bleeding edge lacks social skills; it's just that once you get past a certain point, formal speech is too damn *slow*.

Except for Susan James. The walking contradiction, the woman so devoted to Communication As Unifier that she'd cut her own brain into disunified chunks to make the point. She was the only one who ever seemed to care who she was talking to. The others spoke only for themselves, even when they spoke to each other. Even James's other cores would speak their own minds in their own way, and let everyone else translate as best they could. It wasn't a problem. Everyone on *Theseus* could read everyone else.

But that didn't matter to Susan James. She fit each of her words to their intended recipient, she *accommodated*.

I am a conduit. I exist to bridge the gap, and I'd bridge nothing if I only told you what these people said. So I am telling you what they *meant*, and it will mean as much to you as you can handle.

Except for Susan James, linguist and Ringleader, whom I trust to speak for herself.

Fifteen minutes to apogee: maximum safe distance, in case *Rorschach* decided to hit back. Far below, the artefact's magnetic field pressed into Ben's atmosphere like God's little finger. Great dark thunderheads converged behind it; turbulent moon-sized curlicues collided in its wake.

Fifteen minutes to apogee, and Bates was still hoping Sarasti would change his mind.

In a way, this was her fault. If she had just treated this new

travail as one more cross to bear, perhaps things would have gone on more or less as before. There would have been some faint hope that Sarasti would have let us grit our teeth and keep on going, besieged now by spring-loaded trapdoors as well as the usual gauntlet of Seiverts and magnets and monsters from the id. But Bates had made an *issue* out of it. It wasn't just another piece of shit in the sewer to her: it was the one that clogged the pipe.

We're on the brink as it is, just surviving the baseline environment of this thing. If it's started taking deliberate countermeasures...I don't see how we can risk it.

Fourteen minutes to apogee, and Amanda Bates was still regretting those words.

On previous expeditions we'd charted twenty-six septa in various stages of development. We'd x-rayed them. We'd done ultrasound. We'd watched them ooze their way across passages or ebb slowly back into the walls. The iris that had snapped shut behind the Gang of Four had been a whole different animal.

And what are the odds that the first one with a hair-trigger just happened to also come with antilaser prismatics? That was no routine growth event. That thing was set for us.

Set by...

That was the other thing. Thirteen minutes to apogee, and Bates was worried about the tenants.

It had always been breaking and entering, of course. That much hadn't changed. But when we'd jimmed the lock we'd thought we were vandalizing an empty summer cottage, still under construction. We'd thought the owners would be out of the picture for a while. We hadn't been expecting one of them to catch us on his way to take a late-night piss. And now that one had, and vanished into the labyrinth, it was natural to wonder what weapons it might keep stashed under the pillow...

Those septa could spring on us any time. How many are there? Are they fixed, or portable? We can't proceed without knowing these things..

At first, Bates had been surprised and delighted when Sarasti

agreed with her.

Twelve minutes to apogee. From this high ground, well above the static, *Theseus* peered down through *Rorschach*'s wrenched and twisted anatomy to keep rock-steady eyes on the tiny wound we'd burned in its side. Our limpet tent covered it like a blister; inside, Jack fed us a second, first-person view of the unfolding experiment.

Sir. We know Rorschach is inhabited. Do we want to risk further provoking the inhabitants? Do we want to risk killing them?

Sarasti hadn't quite looked at her, and hadn't quite spoken. If he had, he might have said *I do not understand how meat like you survived to adulthood.*

Eleven minutes to apogee, and Amanda Bates was lamenting the fact—not for the first time—that this mission was not under military jurisdiction.

We were waiting for maximum distance before performing the experiment. *Rorschach might interpret this as a hostile act*, Sarasti had conceded in a voice that contained no trace of irony whatsoever. Now he stood before us, watching ConSensus play on the table. Reflections writhed across his naked eyes, not quite masking the deeper reflections behind them.

Ten minutes to apogee. Susan James was wishing that Cunningham would put out that goddamned cigarette. The smoke stank on its way to the ventilators, and anyway, it wasn't *necessary*. It was just an anachronistic affectation, an attention-getting device; if he needed the nicotine a patch could have soothed his tremors just as easily, without the smoke and the stink.

That wasn't all she was thinking, though. She was wondering why Cunningham had been summoned to Sarasti's quarters earlier in the shift, why he'd looked at her so strangely afterward. I wondered about that myself. A quick check on ConSensus timestamps showed that her medical file had been accessed during that period. I checked those stats, let the shapes bounce between hemispheres: part of my brain locked on *elevated oxytocin* as the probable reason for that conference. There was an eighty-two percent chance that James had

become too *trusting* for Sarasti's liking.

I had no idea how I knew that. I never did.

Nine minutes to apogee

Barely a molecule of *Rorschach's* atmosphere had been lost on our account. That was all about to change. Our view of base camp split like a dividing bacterium: one window now focused on the limpet tent, the other on a wide-angle tactical enhance of the space around it.

Eight minutes to apogee. Sarasti pulled the plug.

Down on *Rorschach*, our tent burst like a bug beneath a boot. A geyser erupted from the wound; a snowstorm swirled at its edges, its charged curlicues intricate as lace. Atmosphere gushed into vacuum, spread thin, crystallized. Briefly, the space around base camp *sparkled*. It was almost beautiful.

Bates didn't think it was beautiful at all. She watched that bleeding wound with a face as expressionless as Cunningham's, but her jaw was clenched unto tetanus. Her eyes darted between views: watching for things gasping in the shadows.

Rorschach convulsed.

Vast trunks and arteries shuddered, a seismic tremor radiating out along the structure. The epicenter began to *twist*, a vast segment rotating on its axis, the breach midway along its length. Stress lines appeared where the length that rotated sheared against the lengths to either side that didn't; the structure seemed to soften and stretch there, constricting like a great elongate balloon torquing itself into sausage links.

Sarasti clicked. Cats made something like that sound when they spied a bird on the far side of a windowpane.

ConSensus groaned with the sound of worlds scraping against each other: telemetry from the onsite sensors, their ears to the ground. Jack's camera controls had frozen again. The image it sent was canted and grainy. The pickup stared blankly at the edge of the hole we'd bored into the underworld.

The groaning subsided. A final faint cloud of crystalline stardust dissipated into space, barely visible even on max enhance.

No bodies. None visible, anyway.

Sudden motion at base camp. At first I thought it was static on Jack's feed, playing along lines of high contrast—but no, something was definitely moving along the edges of the hole we'd burned. Something almost *wiggled* there, a thousand gray mycelia extruding from the cut surface and writhing slowly into the darkness. "It's—huh," Bates said. "Triggered by the pressure drop, I guess. That's one way to seal a breach."

Two weeks after we'd wounded it, *Rorschach* had begun to heal itself.

Apogee behind us now. All downhill from here. *Theseus* began the long drop back into enemy territory.

"Doesn't use septa," Sarasti said.

MY GENES DONE GONE AND TRICKED MY BRAIN
BY MAKING FUCKING FEEL SO GREAT
THAT'S HOW THE LITTLE CREEPS ATTAIN
THEIR PLAN TO FUCKIN' REPLICATE
BUT BRAIN'S GOT TRICKS ITSELF, YOU SEE
TO GET THE BANG BUT NOT THE BITE
I GOT THIS HERE VASECTOMY
MY GENES CAN FUCK *THEMSELVES* TONIGHT.

—THE R-SELECTORS, TRUNCLADE

FIRST-PERSON SEX—*real* sex, as Chelsea insisted on calling it—was an acquired taste: jagged breathing, the raw slap and stink of sweaty skin full of pores and blemishes, a whole other person with a whole other set of demands and dislikes. There was definite animal appeal, no doubt about it. This was, after all, how we'd done it for millions of years. But this, this third-world carnality had always carried an element of struggle, of asynchronous patterns in conflict. There was no convergence here. There was only the rhythm of bodies in collision, a struggle for dominance, each trying to force the other into synch.

Chelsea regarded it as love in its purest form. I came to think of it as hand-to-hand combat. Before, whether fucking creations from my own menu or slip-on skins from someone else's, *I* had always selected the contrast and the rez, the texture and the attitude. The bodily functions, the resistance of competing desires, the endless foreplay that wears your tongue to the root and leaves your face sticky and glistening—just kinks, today. Options for the masochistic.

But there were no options with Chelsea. With her, everything came standard.

I indulged her. I guess I was no more patient with her perversions than she was with my ineptitude at them. Other things made it worth the effort. Chelsea would argue about anything under the sun, wry and insightful and curious as a cat. She would pounce without warning. Retired to the redundant majority, she still took such simple joy in the very act of being *alive*. She was impulsive and impetuous. She cared about people. Pag. *Me*. She wanted to know me. She wanted in.

That was proving to be a problem.

"We could try it again," she said once in an aftermath of sweat and pheromones. "And you won't even remember what you were so upset about. You won't even remember you *were* upset, if you don't want to."

I smiled and looked away; suddenly the planes of her face were coarse and unappealing. "How many times is that now? Eight? Nine?"

"I just want you to be *happy*, Cyg. True happiness is one hell of a gift, and I can give it to you if you'll let me."

"You don't want me happy," I said pleasantly. "You want me customized."

She *mmm'd* into the hollow of my throat for a moment. Then: "What?"

"You just want to change me into something more, more *accommodating*."

Chelsea lifted her head. "Look at me."

I turned my head. She'd shut down the chromatophores in her cheek; the tattoo, transplanted, fluttered now on her shoulder.

"Look at my eyes," Chelsea said.

I looked at the imperfect skin around them, at the capillaries wriggling across the whites. I felt a distant bemusement that such flawed, decaying organs were still able to hypnotize me on occasion.

"Now," Chelsea said. "What do you mean by that?"

I shrugged. "You keep pretending this is a partnership. We both know it's a competition."

"A competition."

"You're trying to manipulate me into playing by your rules."

"What *rules*?"

"The way you want the relationship run. I don't blame you, Chelse, not in the least. We've been trying to manipulate each other for as long as—hell, it's not even Human nature. It's *mammalian*."

"I don't believe it." She shook her head. Ropy tendrils of hair swung across her face. "It's the middle of the twenty-first Century and you're hitting me with this *war of the sexes* bullshit?"

"Granted, your *tweaks* are a pretty radical iteration. Get right in there and reprogram your mate for optimum servility."

"You actually think I'm trying to, to *housebreak* you? You think I'm trying to train you like a puppy?"

"You're just doing what comes naturally."

"I can't believe you'd pull this shit on me."

"I thought you valued honesty in relationships."

"*What* relationship? According to you there's no such thing. This is just—mutual rape, or something."

"That's what relationships *are*."

"*Don't pull that shit on me*." She sat up, swung her feet over the edge of the bed. Putting her back to me. "I know how I *feel*. If I know *anything* I know that much. And I only wanted to make you happy."

"I know you believe that," I said gently. "I know it doesn't *feel* like a strategy. Nothing does when it's wired that deeply. It just feels *right*, it feels natural. It's nature's trick."

"It's *someone's* fucking trick."

I sat up next to her, let my shoulder brush hers. She leaned away.

"I know this stuff," I said after a while. "I know how people work. It's my job."

It was hers too, for that matter. Nobody who spliced brains for a living could possibly be unaware of all that basic wiring in the sub-basement. Chelsea had simply chosen to ignore it; to have admitted anything would have compromised her righteous anger.

I could have pointed that out too, I suppose, but I knew how much stress the system could take and I wasn't ready to test it to destruction. I didn't want to lose her. I didn't want to lose that feeling of safety, that sense that it made a difference whether I lived or died. I only wanted her to back off a bit. I only wanted room to breathe.

"You can be such a reptile sometimes," she said.

Mission accomplished.

Our first approach had been all caution and safety margins. This time we came in like a strike force.

Scylla burned towards *Rorschach* at over two gees, its trajectory a smooth and predictable arc ending at the ruptured base camp. It may have even landed there, for all I know; perhaps Sarasti had two-birded the mission, programmed the shuttle for some collecting of its own. If so, it wouldn't land with us on board. *Scylla* spat us into space almost fifty kilometers short of the new beachhead, left us naked and plummeting on some wireframe contraption with barely enough reaction mass for a soft landing and a quick getaway. We didn't even have control over *that*: success depended on unpredictability, and how better to ensure that than to not even know ourselves what we were doing?

Sarasti's logic. Vampire logic. We could follow it partway: the colossal deformation that had sealed *Rorschach*'s breach was so much slower, so much more expensive than the dropgate that had trapped the Gang. The fact that dropgates *hadn't* been used implied that they took time to deploy—to redistribute necessary mass, perhaps, or spring-load its reflexes. That gave us a window. We could still venture into the den so long as the lions couldn't predict our destination and set traps in advance. So long as we got out again before they could set them afterwards.

"Thirty-seven minutes," Sarasti had said, and none of us could fathom how he'd come to that number. Only Bates had dared to

ask aloud, and he had merely glinted at her: "You can't follow."

Vampire logic. From an obvious premise to an opaque conclusion. Our lives depended on it.

The retros followed some preprogrammed algorithm that mated Newton with a roll of the dice. Our vector wasn't completely random—once we'd eliminated raceways and growth zones, areas without line-of-sight escape routes, dead ends and unbranched segments ("Boring," Sarasti said, dismissing them), barely ten percent of the artefact remained in the running. Now we dropped towards a warren of brambles eight kilometers from our original landing site. Here in the midst of our final approach, there was no way that even we could predict our precise point of impact.

If *Rorschach* could, it deserved to win.

We fell. Ridged spires and gnarled limbs sectioned the sky wherever I looked, cut the distant starscape and the imminent superJovian into a jagged mosaic veined in black. Three kilometers away or thirty, the tip of some swollen extremity burst in a silent explosion of charged particles, a distant fog of ruptured, freezing atmosphere. Even as it faded I could make out wisps and streamers swirling into complex spirals: *Rorschach's* magnetic field, sculpting the artefact's very breath into radioactive sleet.

I'd never seen it with naked eyes before. I felt like an insect on a starry midwinter's night, falling through the aftermath of a forest fire.

The sled fired its brakes. I snapped back against the webbing of my harness, bumped against the rebounding armored body next to me. Sascha. *Only Sascha*, I remembered. Cunningham had sedated the rest of them, left this one core lonely and alone in the group body. I hadn't even realized that that was possible with multiple personalities. She stared back at me from behind her faceplate. None of her surfaces showed through the suit. I could see nothing in her eyes.

That was happening so often, these days.

Cunningham was not with us. Nobody had asked why, when Sarasti assigned the berths. The biologist was first among

equals now, a backup restored with no other behind him. The second-least replaceable of our irreplaceable crew.

It made me a better bargain. The odds I bought had increased to one in three.

A silent bump shuddered up the frame. I looked forward again, past Bates on the front pallet, past the anchored drones that flanked her two to each side. The sled had launched its assault, a prefab inflatable vestibule mounted on an explosive injection assembly that would punch through *Rorschach's* skin like a virus penetrating a host cell. The spindle-legged contraption dwindled and disappeared from my sight. Moments later a pinpoint sodium sun flared and died against the ebony landscape ahead—antimatter charge, so small you could almost count the atoms, shot directly into the hull. A lot rougher than the tentative foreplay of our first date.

We landed, hard, while the vestibule was still inflating. The grunts were off the sled an instant before contact, spitting tiny puffs of gas from their nozzles, arranging themselves around us in a protective rosette. Bates was up next, leaping free of her restraints and sailing directly towards the swelling hab. Sascha and I unloaded the fiberop hub—a clamshell drum half a meter thick and three times as wide—lugging it between us while one of the grunts slipped through the vestibule's membranous airlock.

"Let's move, people." Bates was hanging off one of the inflatable's handholds. "Thirty minutes to—"

She fell silent. I didn't have to ask why: the advance grunt had positioned itself over the newly-blasted entrance and sent back its first postcard.

Light from below.

You'd think that would have made it easier. Our kind has always feared the dark; for millions of years we huddled in caves and burrows while unseen things snuffled and growled—

or just *waited*, silent and undetectable—in the night beyond. You'd think that any light, no matter how meager, might strip away some of the shadows, leave fewer holes for the mind to fill with worst imaginings.

You'd think.

We followed the grunt down into a dim soupy glow like blood-curdled milk. At first it seemed as though the atmosphere itself was alight, a luminous fog that obscured anything more than ten meters distant. An illusion, as it turned out; the tunnel we emerged into was about three meters wide and lit by rows of raised glowing dashes—the size and approximate shape of dismembered human fingers—wound in a loose triple helix around the walls. We'd recorded similar ridges at the first site, although the breaks had not been so pronounced and the ridges had been anything but luminous.

"Stronger in the near-infrared," Bates reported, flashing the spectrum to our HUDs. The air would have been transparent to pit vipers. It *was* transparent to sonar: the lead grunt sprayed the fog with click trains and discovered that the tunnel widened into some kind of chamber seventeen meters further along. Squinting in that direction I could just make out subterranean outlines through the mist. I could just make out jawed things, pulling back out of sight.

"Let's go," Bates said.

We plugged in the grunts, left one guarding the way out. Each of us took another as a guardian angel on point. The machines spoke to our HUDs via laser link; they spoke to each other along stiffened lengths of shielded fiberop that unspooled from the hub trailing in our wake. It was the best available compromise in an environment without any optima. Our tethered bodyguards would keep us all in touch during lone excursions around corners or down dead ends.

Yeah. *Lone* excursions. Forced to either split the group or cover less ground, we were to split the group. We were speed-cartographers panning for gold. Everything we did here was an act of faith: faith that the unifying principles of *Rorschach's* internal architecture could be derived from the raw dimensions

we'd grab on the run. Faith that *Rorschach's* internal architecture even *had* unifying principles. Earlier generations had worshipped malign and capricious spirits. Ours put its faith in an ordered universe. Here in the Devil's Baklava, it was easy to wonder if our ancestors hadn't been closer to the mark.

We moved along the tunnel. Our destination resolved to merely human eyes: not so much chamber as *nexus*, a knot of space formed by the convergence of a dozen tunnels angling in from different orientations. Ragged meshes of quicksilver dots gleamed along several glistening surfaces; shiny protrusions poked through the substrate like a scattershot blast of ball-bearings pressed into wet clay.

I looked at Bates and Sascha. "Control panel?"

Bates shrugged. Her drones panned the throats around us, spraying sonar down each. My HUD sketched a patchy three-d model from the echoes: swathes of paint thrown against invisible walls. We were dots near the center of a ganglion, a tiny swarm of parasites infesting some great hollowed host. Each tunnel curved away in a gradual spiral, each along a different orientation. Sonar could peep around those bends a few meters further than we could. Neither eyes nor ultrasonics saw anything to distinguish one choice from another.

Bates pointed down one of the passageways—"Keeton—" and another—"Sascha," before turning to coast off down her own unbeaten path.

I looked uneasily down mine. "Any particular—"

"Twenty-five minutes," she said.

I turned and jettied slowly down my assigned passageway. The passage curved clockwise, a long unremarkable spiral; after twenty meters that curvature would have blocked any view of its entrance even if the foggy atmosphere hadn't. My drone kept point across the tunnel, its sonar clicking like the chattering of a thousand tiny teeth, its tether unspooling back to the distant drum in the nexus.

It was a comfort, that leash. It was *short*. The grunts could stray ninety meters and no further, and we were under strict orders to stay under their wings at all times. This dim infested

burrow might lead all the way to hell, but I would not be expected to follow it nearly so far. My cowardice had official sanction.

Fifty meters to go. Fifty meters and I could turn and run with my tail between my legs. In the meantime all I had to do was grit my teeth, and focus, and record: *everything you see*, Sarasti had said. *As much as possible of what you can't*. And hope that this new reduced time limit would expire before *Rorschach* spiked us into gibbering dementia.

The walls around me twitched and shivered like the flesh of something just-killed. Something darted in and out of sight with a faint cackle of laughter.

Focus. Record. If the grunt doesn't see it, it's not real.

Sixty-five meters in, one of the ghosts got inside my helmet.

I tried to ignore it. I tried to look away. But this phantom wasn't flickering at the edge of vision; it hovered near the center of my faceplate, floating like a spot of swirling dizziness between me and the HUD. I gritted my teeth and tried to look past, stared into the dim bloody haze of the middle distance, watched the jerky unfolding travelogues in the little windows labeled *Bates* and *James*. Nothing out there. But in *here*, floating before my eyes, *Rorschach's* latest headfuck smeared a fuzzy thumbprint right in front of the sonar feed.

"New symptom," I called in. "Nonperipheral hallucination, stable, pretty formless though. No spiking that I can—"

The inset marked *Bates* skidded hard about. "*Keet—*"

Window and voice cut out together.

Not just *Bates'* window, either. Sascha's inset and the drone's-eye sonarscape flickered and died at the same moment, stripped my HUD bare except for in-suit feeds and a little red readout flashing Link Down. I spun but the grunt was still there, three meters off my right shoulder. Its optical port was clearly visible, a ruby thumbnail set into the plastron.

Its gun ports were visible too. Pointing at me.

I froze. The drone *shivered* in some local electromagnetic knot as if terrified. Of me, or—

Of something *behind* me...

I started to turn. My helmet filled with sudden static, and with what sounded—faintly—like a voice:

"—ucking *move*, Kee—not—"

"Bates? *Bates?*" Another icon had bloomed in place of Link Down. The grunt was using *radio* for some reason—and though almost close enough to touch, I could barely make out the signal.

A hash of Batespeak: "—to your—right in *front* of—" and Sascha as well, a bit more clearly: "—an't he *see* it?..."

"See what? *Sascha!* Someone tell me what—see *what?*"

"—read? Keeton, do you read?"

Somehow Bates had boosted the signal; static roared like an ocean, but I could hear the words behind it. "Yes! What—"

"*Keep absolutely still*, do you understand? *Absolutely still*. Acknowledge."

"Acknowledged." The drone kept me in its shaky sights, dark stereocam irises spasming wide, stuttering to pinpoints. "Wha—"

"There's something in front of you, Keeton. Directly between you and the grunt. Can't you see it?"

"N-no. My HUD's down—"

Sascha broke in: "How can he not *see* it it's right *th*—"

Bates barked over her: "It's man-sized, radially symmetrical, eight, nine arms. Like tentacles, but—segmented. Spiky."

"I don't see anything," I said. But I did: I saw something reaching for me, in my pod back aboard *Theseus*. I saw something curled up motionless in the ship's spine, watching as we laid our best plans.

I saw Michelle the synesthesiatic, curled into a fetal ball: *You can't see it...it's in—visible...*

"What's it doing?" I called. *Why can't I see it? Why can't I see it?*

"Just—floating there. Kind of waving. Oh, *sh—Keet—*"

The grunt skidded sideways, as if slapped by a giant hand. It bounced off the wall and suddenly the laser link was back, filling the HUD with intelligence: first-person perspectives of Bates and Sascha racing along alien tunnels, a grunt's-eye view

of a space suit with *Keeton* stenciled across its breastplate and there, right beside it, some *thing* like a rippling starfish with too many arms—

The Gang barreled around the curve and now I almost *could* see something with my own eyes, flickering like heat-lightning off to one side. It was large, and it was moving, but somehow my eyes just *slid off* every time they tried to get a fix. *It's not real*, I thought, giddy with hysterical relief, *it's just another hallucination* but then Bates sailed into view and it was *right there*, no flickering, no uncertainty, nothing but a collapsed probability wave and solid, undeniable mass. Exposed, it grabbed the nearest wall and scrambled over our heads, segmented arms flailing like whips. A sudden crackling buzz in the back of my head and it was drifting free again, charred and smoking.

A stuttering click. The whine of machinery gearing down. Three grunts hovered in formation in the middle of the passageway. One faced the alien. I glimpsed the tip of some lethal proboscis sliding back into its sheath. Bates shut the grunt down before it had finished closing its mouth.

Optical links and three sets of lungs filled my helmet with a roar of heavy breathing.

The offlined grunt drifted in the murky air. The alien carcass bumped gently off the wall, twitching: a hydra of human backbones, scorched and fleshless. It didn't look much like my on-board visions after all.

For some reason I couldn't put my finger on, I found that almost reassuring.

The two active grunts panned the fog until Bates gave them new orders; then one turned to secure the carcass, the other to steady its fallen comrade. Bates grabbed the dead grunt and unplugged its tether. "Fall back. Slowly. I'm right behind you."

I tweaked my jets. Sascha hesitated. Coils of shielded cable floated about us like umbilical cords.

"Now," Bates said, plugging a feed from her own suit directly into the offlined grunt.

Sascha started after me. Bates took up the rear. I watched my

HUD; a swarm of multiarmed monsters would appear there any moment.

They didn't. But the blackened thing against the belly of Bates' machine was real enough. Not a hallucination. Not even some understandable artefact of fear and synesthesia. *Rorschach* was inhabited. Its inhabitants were invisible.

Sometimes. Sort of.

And, oh yeah. We'd just killed one.

Bates threw the deactivated grunt into the sky as soon as we'd made vacuum. Its comrades used it for target practice while we strapped in, firing and firing until there was nothing left but cooling vapor. *Rorschach* spun even that faint plasma into filigree before it faded.

Halfway back to *Theseus*, Sascha turned to the Major: "You—" "No."

"But— they do shit on their own, right? Autonomous."

"Not when they're slaved."

"Malfunction? Spike?"

Bates didn't answer.

She called ahead. By the time we made it back Cunningham had grown another little tumor on *Theseus*' spine, a remote surgery packed with teleops and sensors. One of the surviving grunts grabbed the carcass and jumped ship as soon as we passed beneath the carapace, completing the delivery as we docked.

We were born again to the fruits of a preliminary necropsy. The holographic ghost of the dissected alien rose from ConSensus like some flayed and horrific feast. Its splayed arms looked like human spinal columns. We sat around the table and waited for someone else to take the first bite.

"Did you have to shoot it with *microwaves*?" Cunningham sniped, tapping the table. "You completely *cooked* the animal. Every cell was blown out from the inside."

Bates shook her head. "There was a malfunction."

He gave her a sour look. "A malfunction that just happens to involve precise targeting of a moving object. It doesn't sound random to me."

Bates looked back evenly. "Something flipped autonomous targeting from *off* to *on*. A coin toss. Random."

"Random is—"

"Give it a rest, Cunningham. I don't need this shit from you right now."

His eyes rolled in that smooth dead face, focused suddenly on something overhead. I followed his gaze: Sarasti stared down at us like an owl panning for meadow voles, drifting slowly in the Coriolis breeze.

No visor this time, either. I knew he hadn't lost it.

He fixed Cunningham. "Your findings."

Cunningham swallowed. Bits and pieces of alien anatomy flickered with color-coded highlights as he tapped his fingers. "Right, then. I'm afraid I can't give you much at the cellular level. There's not much left inside the membranes. Not many membranes left, for that matter. In terms of gross morphology, the specimen's dorsoventrally compressed and radially symmetrical, as you can see. Calcareous exoskeleton, keratinised plastic cuticle. Nothing special."

Bates looked skeptical. "*Plastic skin* is 'nothing special'?"

"Given the environment I was half-expecting a Sanduloviciu plasma. Plastic's simply refined petroleum. Organocarbon. This thing is carbon-based. It's even *protein* based, although its proteins are a great deal tougher than ours. Numerous sulphur cross-bonds for lateral bracing, as far as I could tell from what your grunts didn't denature." Cunningham's eyes looked past us all; his consciousness was obviously far aft, haunting remote sensors. "The thing's tissues are saturated with magnetite. On earth you find that material in dolphin brains, migratory birds, even some bacteria—anything that navigates or orients using magnetic fields. Moving up to macrostructures we've got a pneumatic internal skeleton, which as far as I can tell doubles as musculature. Contractile tissue squeezes gas through a

system of bladders that stiffen or relax each segment in the arms."

The light came back into Cunningham's eyes long enough to focus on his cigarette. He brought it to his mouth, dragged deeply, set it down again. "Note the invaginations around the base of each arm." Flaccid balloons glowed orange on the virtual carcass. "*Cloacae*, you could call them. Everything opens into them: they eat, breathe, and defecate through the same little compartment. No other major orifices."

The Gang made a face that said *Sascha, grossed out*. "Don't things get—clogged up? Seems inefficient."

"If one gets plugged, there's eight other doors into the same system. You'll wish you were so *inefficient* the next time you choke on a chicken bone."

"What *does* it eat?" Bates asked.

"I couldn't say. I found gizzard-like contractiles around the cloacae, which implies they *chew* on something, or did at some point in their history. Other than that..." He spread his hands; the cigarette left faint streamers in its wake. "Inflate those contractiles enough and you create an airtight seal, by the way. In conjunction with the cuticle, that would allow this organism to survive briefly in vacuum. And we already know it can handle the ambient radiation, although don't ask me how. Whatever it uses for genes must be a great deal tougher than ours."

"So it can survive in space," Bates mused.

"In the sense that a dolphin survives underwater. Limited time only."

"How long?"

"I'm not certain."

"Central nervous system," Sarasti said.

Bates and the Gang grew suddenly, subtly still. James's affect seeped out over her body, supplanting Sascha's.

Smoke curled from Cunningham's mouth and nose. "There's nothing *central* about it, as it transpires. No cephalisation, not even clustered sense organs. The body's covered with something like eyespots, or chromatophores, or both. There are setae

everywhere. And as far as I can tell—if all those little cooked filaments I've been able to put back together after your *malfunction* really are nerves and not something completely different—every one of those structures is under independent control."

Bates sat up straight. "Seriously?"

He nodded. "It would be akin to independently controlling the movement of each individual hair on your head, although this creature is *covered* with little hairs from tip to tip. The same thing applies to the eyes. Hundreds of thousands of eyes, all over the cuticle. Each one is barely more than a pinhole camera, but each is capable of independent focus and I'm guessing all the different inputs integrate somewhere up the line. The entire body acts like a single diffuse retina. In theory that gives it enormous visual acuity."

"A distributed telescope array," Bates murmured.

"A chromatophore underlies each eye—the pigment's some kind of cryptochrome so it's probably involved in vision, but it can also diffuse or contract through the local tissue. That implies dynamic pigment patterns, like a squid or a chameleon."

"Background pattern-matching?" Bates asked. "Would that explain why Siri couldn't see it?"

Cunningham opened a new window and played grainy looped imagery of Siri Keeton and his unseen dance partner. The creature I hadn't noticed was ominously solid to the cameras: a floating discoid twice as wide as my own torso, arms extending from its edges like thick knotted ropes. Patterns rippled across its surface in waves; sunlight and shadow playing on a shallow seabed.

"As you can see, the background doesn't match the pattern," Cunningham said. "It's not even close."

"Can you explain Siri's blindness to it?" Sarasti said.

"I can't," Cunningham admitted. "It's beyond ordinary crypsis. But *Rorschach* makes you see all sorts of things that aren't there. Not seeing something that *is* there might come down to essentially the same thing."

"Another hallucination?" I asked.

Another shrug while Cunningham sucked smoke. "There are many ways to fool the human visual system. It's interesting that the illusion failed when multiple witnesses were present, but if you want a definitive mechanism you'll have to give me more to work with than *that*." He stabbed his cigarette hand at the crisped remains.

"But—" James took a breath, bracing herself— "We're talking about something... sophisticated, at least. Something very complex. A great deal of processing power."

Cunningham nodded again. "I'd estimate nervous tissue accounts for about thirty percent of body mass."

"So it's intelligent." Her voice was almost a whisper.

"Not remotely."

"But—thirty percent—"

"Thirty percent *motor and sensory* wiring." Another drag. "Much like an octopus; an enormous number of neurons, but half of them get used up running the suckers."

"My understanding is that octopi are quite intelligent," James said.

"By molluscan standards, certainly. But do you have any *idea* how much extra cabling you'd need if the photoreceptors in your eye were spread across your entire body? You'd need about three hundred million extension cords to begin with, ranging from half a millimeter to two meters long. Which means all your signals are staggered and out of synch, which means billions of additional logic gates to cohere the input. And that just gets you a single static image, with no filtering, no interpretation, no time-series integration at all." Shiver. Drag. "Now multiply that by all the extra wiring needed to *focus* all those eyespots on an object, or to send all that information back to individual chromatophores, and then add in the processing power you need to *drive* those chromatophores one at a time. Thirty percent might do all that, but I strongly doubt you'd have much left over for philosophy and science." He waved his hand in the general direction of the hold. "That—that—"

"*Scrambler*," James suggested.

Cunningham rolled his tongue around it. "Very well. That

scrambler is an absolute miracle of evolutionary engineering. It's also dumb as a stick."

A moment's silence.

"So what is it?" James asked at last. "Somebody's pet?"

"Canary in a coal mine," Bates suggested.

"Perhaps not even that," Cunningham said. "Perhaps no more than a white blood cell with waldoes. Maintenance bot, maybe. Teleoperated, or instinct-driven. But people, we're ignoring far greater questions here. How could an anaerobe even develop complex multicellular anatomy, much less move as *fast* as this thing did? That level of activity burns a great deal of ATP."

"Maybe they don't use ATP," Bates said as I thumbnailed: *adenosine triphosphate*. Cellular energy source.

"It was *crammed* with ATP," Cunningham told her. "You can tell that much even with *these* remains. The question is, how can it synthesize the stuff fast enough to keep up with demand. Purely anaerobic pathways wouldn't suffice."

Nobody offered any suggestions.

"Anyway," he said, "So endeth the lesson. If you want gory details, check ConSensus." He wiggled the fingers of his free hand: the spectral dissection vanished. "I'll keep working, but if you want any real answers go get me a live one." He butted out his cigarette against the bulkhead and stared defiantly around the drum.

The others hardly reacted; their topologies still sparkled from the revelations of a few minutes before. Perhaps Cunningham's pet peeve *was* more important to the Big Picture; perhaps, in a reductionist universe, biochemical basics should always take priority over the finer points of ETI and interspecies etiquette. But Bates and the Gang were time-lagged, processing earlier revelations. Not just *processing*, either: wallowing. They clung to Cunningham's findings like convicted felons who'd just discovered they might be freed on a technicality.

Because the scrambler was dead at our hands, no doubt about it. But it wasn't an *alien*, not really. It wasn't *intelligent*. It was just a blood cell with waldoes. It was dumb as a stick.

And property damage is so much easier to live with than

murder.

PROBLEMS CANNOT BE SOLVED AT THE SAME LEVEL OF
AWARENESS THAT CREATED THEM.

—ALBERT EINSTEIN

ROBERT PAGLINO HAD set me up with Chelsea in the first place. Maybe he felt responsible when the relationship started jumping the rails. Or maybe Chelsea, Madam Fix-It that she was, had approached him for an intervention. For whatever reason, it was obvious the moment we took our seats at QuBit's that his invitation had not been entirely social.

He went for some neurotrope cocktail on the rocks. I stuck with Rickard's.

"Still old-school," Pag said.

"Still into foreplay," I observed.

"That obvious, huh?" He took a sip. "That'll teach me to try the subtle approach with a professional jargonaut."

"Jargonaut's got nothing to do with it. You wouldn't have fooled a border collie." Truth be told, Pag's topology never really told me much that I didn't already know. I never really had much of an edge in reading him. Maybe we just knew each other too well.

"So," he said, "spill."

"Nothing to spill. She just got to know the real me."

"That is bad."

"What'd she tell you?"

"Me? Nothing at all."

I gave him a look over the top of my glass.

He sighed. "She knows you're cheating on her."

"I'm what?"

"Cheating. With the skin."

"It's based on *her*!"

"But it *isn't* her."

"No it isn't. It doesn't fart or fight or break into tears every time you don't want to be dragged off to meet its family. Look, I love the woman dearly, but come *on*. When was the last time *you* tried first-person fucking?"

"Seventy-four," he said.

"You're kidding." I'd have guessed *never*.

"Did some third-world medical missionary work between gigs. They still bump and grind in Texas." Pag swigged his trope. "Actually, I thought it was alright."

"The novelty wears off."

"Evidently."

"And it's not like I'm doing anything unusual here, Pag. *She's* the one with the kink. And it's not just the sex. She keeps *asking* about—she keeps wanting to *know* things."

"Like what?"

"Irrelevant stuff. My life as a kid. My family. Nobody's fucking business."

"She's just taking an interest. Not everyone considers childhood memories off-limits, you know."

"Thanks for the insight." As if people had never *taken an interest* before. As if Helen hadn't *taken an interest* when she went through my drawers and filtered my mail and followed me from room to room, asking the drapes and the furniture why I was always so sullen and withdrawn. She'd taken such an interest that she wouldn't let me out the door until I confided in her. At twelve I'd been stupid enough to throw myself on her mercy, *It's personal, Mom. I'd just rather not talk about it*. Then I'd made my escape into the bathroom when she demanded to know if *it* was trouble online, trouble at school, was it a girl, was it a—*a boy*, what *was* it and why couldn't I just *trust* my *own mother*, don't I know I can trust her with *anything*? I waited out the persistent knocking and the insistent concerned voice through the door and the final, grudging silence that followed. I waited until I was absolutely sure she'd gone away, I waited for five fucking *hours* before I came out and there she was, arms folded in the hall, eyes brimming with reproach and disappointment. That night she took the lock off the bathroom

door because *family should never shut each other out*. Still taking an interest.

"Siri," Pag said quietly.

I slowed my breathing, tried again: "She doesn't just want to *talk* about family. She wants to *meet* them. She keeps trying to drag me to meet *hers*. I thought I was hooking up with *Chelsea*, you know, nobody ever told me I'd have to share airspace with..."

"You do it?"

"Once." Reaching, grasping things, feigning acceptance, feigning *friendship*. "It was great, if you like being ritually pawed by a bunch of play-acting strangers who can't stand the sight of you and don't have the guts to admit it."

Pag shrugged, unsympathetic. "Sounds like typical old-school family. You're a synthesist, man. You deal with way wonkier dynamics than *that*."

"I deal with *other people's* information. I don't vomit my own personal life into the public sphere. Whatever hybrids and the constructs I work with, they don't—"

—*touch*—

"Interrogate," I finished.

"You knew Chelse was an old-fashioned girl right off the top."

"Yeah, when it suits her." I gulped ale. "But she's cutting-edge when she's got a splicer in her hand. Which isn't to say that her strategies couldn't use some work."

"Strategies."

It's not a strategy, for God's sake! Can't you see I'm hurting? I'm on the fucking floor, Siri, I'm curled up in a ball because I'm hurting so much and all you can do is criticize my tactics? What do I have to do, slash my goddamn wrists?

I'd shrugged and turned away. *Nature's trick*.

"She *cries*," I said now. "High blood-lactate levels, makes it easy for her. It's just chemistry but she holds it up like it was some kind of IOU."

Pag pursed his lips. "Doesn't mean it's an act."

"Everything's an act. Everything's strategy. You know that." I snorted. "And *she's* miffed because *I* base a skin on her?"

"I don't think it's so much the actual skin as the fact that you didn't tell her. You know how she feels about honesty in relationships."

"Sure. She doesn't want any."

He looked at me.

"Give me some credit, Pag. You think I should tell her that sometimes the sight of her makes me shudder?"

The system called Robert Paglino sat quietly, and sipped his drugs, and set the things he was about to say in order. He took a breath.

"I can't believe you could be so fucking dumb," he said.

"Yeah? Enlighten me."

"Of *course* she wants you to tell her you only have eyes for her, you love her pores and her morning breath, and why stop at one tweak how about ten. But that doesn't mean she wants you to *lie*, you idiot. She wants all that stuff to be *true*. And—well, why *can't* it be?"

"It isn't," I said.

"*Jesus*, Siri. People aren't *rational*. *You* aren't rational. We're not thinking machines, we're—we're feeling machines that happen to think." He took a breath, and another hit. "And you already know that, or you couldn't do your job. Or at least—" He grimaced— "the system knows."

"The system."

Me and my protocols, he meant. My *Chinese Room*.

I took a breath. "It doesn't work with everyone, you know."

"So I've noticed. Can't read systems you're too entangled with, right? Observer effect."

I shrugged.

"Just as well," he said. "I don't think I'd like you all that much in that *room* of yours."

It came out before I could stop it: "Chelse says she'd prefer a *real* one."

He raised his eyebrows. "Real what?"

"Chinese Room. She says it would have better comprehension."

The Qube murmured and clattered around us for a few

moments.

"I can see why she'd say that," Pag said at last. "But you— you did okay, Pod-man."

"I dunno."

He nodded, emphatic. "You know what they say about the road less traveled? Well, you carved your *own* road. I don't know why. It's like learning calligraphy using your toes, you know? Or proprioceptive polyneuropathy. It's amazing you can do it at all; it's *mindboggling* that you actually got *good* at it."

I squinted at him. "Proprio—"

"There used to be people without any sense of—well, of themselves, physically. They couldn't feel their bodies in space, had no idea how their own limbs were arranged or even if they *had* limbs. Some of them said they felt *pithed*. Disembodied. They'd send a motor signal to the hand and just have to take it on faith that it arrived. So they'd use vision to compensate; they couldn't feel where the hand was so they'd *look* at it while it moved, use sight as a substitute for the normal force-feedback you and I take for granted. They could walk, if they kept their eyes focused on their legs and concentrated on every step. They'd get pretty good at it. But even after years of practice, if you distracted them in mid-step they'd go over like a beanstalk without a counterweight."

"You're saying I'm like that?"

"You use your *Chinese room* the way they used vision. You've reinvented empathy, almost from scratch, and in some ways—not *all* obviously, or I wouldn't have to tell you this—but in some ways yours is better than the original. It's why you're so good at synthesis."

I shook my head. "I just observe, that's all. I watch what people do, and then I imagine what would make them do that."

"Sounds like empathy to me."

"It's not. Empathy's not so much about imagining how the other guy feels. It's more about imagining how *you'd* feel in the same place, right?"

Pag frowned. "So?"

"So what if you don't *know* how you'd feel?"

He looked at me, and his surfaces were serious and completely transparent. "You're better than that, friend. You may not always act like it, but—I know you. I knew you *before*."

"You knew someone else. I'm *Pod-man*, remember?"

"Yeah, that was someone else. And maybe I remember him better than you do. But I'll tell you one thing." He leaned forward. "*Both* of you would've helped me out that day. And maybe he would've got there with good ol'-fashioned empathy while you had to cobble together some kind of improvised flowchart out of surplus parts, but that just makes your accomplishment all the greater. Which is why I continue to stick it out with you, old buddy. Even though you have a rod up your ass the size of the Rio Spire."

He held out his glass. Dutifully, I clinked it against my own. We drank.

"I don't remember him," I said after a while.

"What, the other Siri? Pre-Pod Siri?"

I nodded.

"Nothing at all?"

I thought back. "Well, he was wracked by convulsions all the time, right? There'd be constant pain. I don't remember any pain." My glass was almost empty; I sipped to make it last. "I—I dream about him sometimes, though. About— *being* him."

"What's it like?"

"It was—colorful. Everything was more saturated, you know? Sounds, smells. Richer than life."

"And now?"

I looked at him.

"You said it *was* colorful. What changed?"

"I don't know. Maybe nothing. I just— I don't actually remember the dreams when I wake up any more."

"So how do you know you still have them?" Pag asked.

Fuck it I thought, and tipped back the last of my pint in a single gulp. "I know."

"How?"

I frowned, taken aback. I had to think for a few moments before I remembered.

"I wake up smiling," I said.

GRUNTS LOOK THE ENEMY IN THE EYE. GRUNTS KNOW THE STAKES. GRUNTS KNOW THE PRICE OF POOR STRATEGY. WHAT DO THE GENERALS KNOW? OVERLAYS AND TACTICAL PLOTS. THE WHOLE CHAIN OF COMMAND IS UPSIDE-DOWN.

—KENNETH LUBIN, *ZERO SUM*

IT WENT BAD from the moment we breached. The plan had called for precise havoc along the new beachhead, subtly arranged to entrap some blood-cell-with-waldoes as it sought to repair the damage. Our job had been to set the trap and stand back, trusting Sarasti's assurances that we would not have long to wait.

We had no time at all. Something squirmed in the swirling dust the moment we breached, serpentine movement down the hole that instantly kicked Bates renowned *field initiative* into high gear. Her grunts dived through and caught a scrambler twitching in their crosshairs, clinging to the wall of the passageway. It must have been stunned by the blast of our entry, a classic case of wrong-place-wrong-time. Bates took a split-second to appraise the opportunity and the plan was plasma.

One of the grunts plugged the scrambler with a biopsy dart before I even had a chance to blink. We would have bagged the whole animal right then if *Rorschach's* magnetosphere hadn't chosen that moment to kick sand in our faces. As it was, by the time our grunts staggered back into action their quarry was already disappearing around the bend. Bates was tethered to her troops; they yanked her down the rabbit hole ("*Set it up!*" she yelled back at Sascha) the moment she let them loose.

I was tethered to Bates. I barely had a chance to exchange a wide-eyed look with Sascha before being yanked away in turn. Suddenly I was *inside* again; the sated biopsy dart bounced off my faceplate and flashed past, still attached to a few meters of discarded monofilament. Hopefully Sascha would pick it up while Bates and I were hunting; at least the mission wouldn't be a total loss if we never made it back.

The grunts dragged us like bait on a hook. Bates flew like a dolphin just ahead of me, keeping effortlessly to the center of the bore with an occasional tweak of her jets. I careened off the walls just behind, trying to stabilize myself, trying to look as though I too might be in control. It was an important pretense. The whole point of being a decoy is to pass yourself off as an original. They'd even given me my own gun, pure precaution of course, more for comfort than protection. It hugged my forearm and fired plastic slugs impervious to induction fields.

Just Bates and I, now. A pacifist soldier, and the odds of a coin toss.

Gooseflesh prickled my skin as it always had. The usual ghosts scrabbled and clawed through my mind. This time, though, the dread seemed muted. Distant. Perhaps it was just a matter of timing, perhaps we were moving so quickly through the magnetic landscape that no one phantom had a chance to stick. Or maybe it was something else. Maybe I wasn't so afraid of ghosts because this time we were after monsters.

The scrambler seemed to have thrown off whatever cobwebs our entrance had spun; it surged along the walls now at full speed, its arms shooting ahead like a succession of striking snakes, slinging the body forward so fast the drones could barely keep it in sight, a writhing silhouette in the fog. Suddenly it leapt sideways, sailing across the width of the passageway and down some minor tributary. The grunts veered in pursuit, crashing into walls, stumbling—

—stopping—

—and suddenly Bates was braking hard, shooting back past me as I flailed with my pistol. I was past the drones in the next instant; my leash snapped tight and snapped back, bringing me

to a dead drifting stop. For a second or two I was on the front line. For a second or two I was the front line, Siri Keeton, note taker, mole, professional uncomprehender. I just floated there, breath roaring in my helmet, as a few meters further on the walls—

Squirmed...

Peristalsis, I thought at first. But this motion was utterly unlike the slow, undulating waves that usually rippled along *Rorschach's* passageways. So *hallucination*, I thought instead—and then those writhing walls reached out with a thousand whiplike calcareous tongues that grabbed our quarry from every direction and *tore it to pieces...*

Something grabbed me and spun me around. Suddenly I was locked against the chest of one of the grunts, its rear guns firing as we retreated back up the tunnel at full speed. Bates was in the arms of the other. Seething motion receded behind us but the image stayed stuck to the backs of my eyes, hallucinatory and point-blank in its clarity:

Scramblers, everywhere. A seething infestation squirming across the walls, reaching out for the intruder, leaping into the lumen of the passageway to press their counterattack.

Not against us. They had attacked one of their own. I'd seen three of its arms ripped off before it had disappeared into a writhing ball in the center of the passageway.

We fled. I turned to Bates—*Did you see*—but held my tongue. The deathly concentration on her face was unmistakable even across two faceplates and three meters of methane. According to HUD she'd lobotomized both grunts, bypassed all that wonderful autonomous decision-making circuitry entirely. She was running both machines herself, as manually as marionettes.

Grainy turbulent echoes appeared on the rear sonar display. The scramblers had finished with their sacrifice. Now they were coming after us. My grunt stumbled and careened against the side of the passage. Jagged shards of alien décor dug parallel gouges across my faceplate, tenderized chunks of thigh through the shielded fabric of my suit. I clenched down on a cry. It got out anyway. Some ridiculous in-suit alarm chirped indignantly

an instant before a dozen rotten eggs broke open inside my helmet. I coughed. My eyes stung and watered in the reek; I could barely see *Seiverts* on the HUD, flashing instantly into the red.

Bates drove us on without a word.

My faceplate healed enough to shut off the alarm. My air began to clear. The scramblers had gained; by the time I could see clearly again they were only a few meters behind us. Up ahead Sascha came into view around the bend, Sascha who had no backup, whose other cores had all been shut down on Sarasti's orders. Susan had protested at first—

"If there's any opportunity to communicate—"

"There won't be," he'd said.

—so there was Sascha who was *more resistant to Rorschach's influence* according to some criterion I never understood, curled up in a fetal ball with her gloves clamped against her helmet and I could only hope to some dusty deity that she'd set the trap before this place had got to her. And here came the scramblers, and Bates was shouting "*Sascha! Get out of the fucking way!*" and braking hard, way too soon, the scrambling horde nipping at our heels like a riptide and Bates yelled "*Sascha!*" again and finally Sascha moved, kicked herself into gear and off the nearest wall and fled right back up the hole we'd blown in through. Bates yanked some joystick in her head and our warrior sedans slewed and shat sparks and bullets and dove out after her.

Sascha had set the trap just within the mouth of the breach. Bates armed it in passing with the slap of one gloved hand. Motion sensors were supposed to do the rest— but the enemy was close behind, and there was no room to spare.

It went off just as I was emerging into the vestibule. The cannon net shot out behind me in a glorious exploding conic, caught something, snapped back up the rabbit hole and slammed into my grunt from behind. The recoil kicked us against the top of the vestibule so hard I thought the fabric would tear. It held, and threw us back against the squirming things enmeshed in our midst.

Writhing backbones everywhere. Articulated arms, lashing like bony whips. One of them entwined my leg and *squeezed* like a brick python. Bates' hands waved in a frantic dance before me and that arm came apart into dismembered segments, bouncing around the enclosure.

This was all wrong. They were supposed to be in the net, they were supposed to be *contained*...

"*Sascha! Launch!*" Bates barked. Another arm separated from its body and careened into the wall, coiling and uncoiling.

The hole had flooded with aerosol foam-core as soon as we'd pulled the net. A scrambler writhed half-embedded in that matrix, caught just a split-second too late; its central mass protruded like some great round tumor writhing with monstrous worms.

"*SASCHA!*"

Artillery. The floor of the vestibule irised shut quick as a leg-hold trap and everything slammed against it, grunts, people, scramblers whole and in pieces. I couldn't breathe. Every thimbleful of flesh weighed a hundred kilograms. Something slapped us to one side, a giant hand batting an insect. Maybe a course correction. Maybe a collision.

But ten seconds later we were weightless again, and nothing had torn us open.

We floated like mites in a ping-pong ball, surrounded by a confusion of machinery and twitching body parts. There was little of anything that might pass for blood. What there was floated in clear, shuddering spherules. The cannon net floated like a shrink-wrapped asteroid in our midst. The things inside had wrapped their arms around themselves, around each other, curled into a shivering and unresponsive ball. Compressed methonia hissed around them, keeping them fresh for the long trip home.

"Holy *shit*," Sascha breathed, watching them. "The bloodsucker called it."

He hadn't called everything. He hadn't called a mob of multiarmed aliens ripping one of their own to pieces before my eyes. He hadn't seen *that* coming.

Or at least, he hadn't mentioned it.

I was already feeling nauseous. Bates was carefully bringing her wrists together. For a moment I could barely make out a taut dark thread of freakwire, fine as smoke, between them. Her caution was well-advised; that stuff would slice through human limbs as easily as alien ones. One of the grunts groomed its mouthparts at her shoulder, cleaning gore from its mandibles.

The freakwire vanished from my sight. Sight itself was dimming, now. The inside of this great lead balloon was going dark around me. We were coasting, purely ballistic. We had to trust that *Scylla* would swoop in and snatch us once we'd achieved a discreet distance from the scene of the crime. We had to trust Sarasti.

That was getting harder by the hour. But he'd been right so far. Mostly.

"How do you *know*?" Bates had asked when he'd first laid out the plan. He hadn't answered. Chances are he couldn't have, not to us, any more than a baseline could have explained brane theory to the inhabitants of Flatland. But Bates hadn't been asking about tactics anyway, not really. Maybe she'd been asking for a *reason*, for something to justify this ongoing trespass into foreign soil, the capture and slaughter of its natives.

On one level she already knew the reason, of course. We all did. We could not afford to merely react. The risks were too great; we had to *preempt*. Sarasti, wise beyond all of us, saw this more clearly than we. Amanda Bates knew he was right in her mind—but perhaps she didn't feel it in her gut. Perhaps, I thought as my vision failed, she was asking Sarasti to convince her.

But that wasn't all she was doing.

Imagine you are Amanda Bates.

The control you wield over your troops would give wet

dreams and nightmares to generals of ages past. You can drop instantly into the sensorium of anyone under your command, experience the battlefield from any number of first-person perspectives. Your every soldier is loyal unto death, asking no questions, obeying all commands with alacrity and dedication to which mere flesh could never even aspire. You don't just respect a chain of command: you *are* one.

You are a little bit scared of your own power. You are a little bit scared of the things you've already done with it.

Taking orders comes as naturally as giving them. Oh, you've been known to question policy on occasion, or seek a bigger picture than may be strictly necessary for the job at hand. Your *command initiative* has become the stuff of legends. But you have never disobeyed a direct order. When asked for your perspective, you serve it straight up and unvarnished— until the decision is made, and the orders handed down. Then you do your job without question. Even when questions arise, you would hardly waste time asking them unless you expected an answer you could use.

Why, then, demand analytical details from a *vampire*?

Not for information. Might as well expect the sighted to explain vision to the congenitally blind. Not for clarification; there was no ambiguity in Sarasti's bottom line. Not even for the benefit of poor dumb Siri Keeton, who may have missed some salient point but is too ashamed to raise his own hand.

No, there is only one reason why you might ask for such details: to *challenge*. To rebel, to the infinitesimal degree that rebellion is permitted once the word is given.

You argued and advocated as forcefully as you could, back when Sarasti was soliciting input. But he ignored yours, abandoned any attempt at communication and preemptively invaded foreign territory. He knew that *Rorschach* might contain living beings and still he tore it open without regard for their welfare. He may have killed helpless innocents. He may have roused an angry giant. You don't know.

All you know is, you've been helping him do it.

You've seen this kind of arrogance before, among your own

kind. You had hoped that smarter creatures would be wiser ones. Bad enough to see such arrogant stupidity inflicted on the helpless, but to do it at these stakes beggars belief. Killing innocents is the *least* of the risks you're running; you're gambling with the fate of worlds, provoking conflict with a star faring technology whose sole offense was to take your picture without permission.

Your dissent has changed nothing. So you rein it in; all that slips out now is the occasional pointless question with no hope of an answer, its inherent insubordination so deeply buried you don't even see it yourself. If you did see it, you'd keep your mouth shut entirely—because the last thing you want is to remind Sarasti that you think he's *wrong*. You don't want him dwelling on that. You don't want him to think you're up to something.

Because you are. Even if you're not quite ready to admit it to yourself.

Amanda Bates is beginning to contemplate a change of command.

The laceration of my suit had done a real number on the gears. It took three solid days for *Theseus* to bring me back to life. But death was no excuse for falling behind the curve; I resurrected with a head full of updates clogging my inlays.

I flipped through them, climbing down into the drum. The Gang of Four sat at the galley below me, staring at untouched portions of nutritionally-balanced sludge on her plate. Cunningham, over in his inherited domain, grunted at my appearance and turned back to work, the fingers of one hand tapping compulsively on the desktop.

Theseus' orbit had widened during my absence, and most of its eccentricities had been planed away. Now we kept our target in view from a more-or-less constant range of three thousand kilometers. Our orbital period lagged *Rorschach's* by an hour—

the alien crept implacably ahead of us along its lower trajectory—but a supplementary burn every couple of weeks would be enough to keep it in sight. We had *specimens* now, things to be examined under conditions of our own choosing; no point in risking any more close approaches until we'd wrung every useful datum from what we had.

Cunningham had expanded his lab space during my time in the sepulcher. He'd built holding pens, one for each scrambler, modules partitioned by a common wall and installed in a whole new hab. The microwaved carcass had been sidelined like a discarded toy from a previous birthday, although according to the access logs Cunningham still visited it every now and then.

Not that he visited *any* part of the new wing in person, of course. Not that he was even able to, not without suiting up and jumping across the hold. The whole compartment had been disconnected from its spinal lock and pushed to a tethered anchorage midway between spine and carapace: Sarasti's orders, given to *minimize risk of contamination*. It was no skin off Cunningham's nose. He was happier leaving his body in pseudogravity anyway, while his consciousness flitted between the waldoes and sensors and bric-a-brac surrounding his new pets.

Theseus saw me coming and pushed a squeezebulb of sugary electrolytes from the galley dispenser. The Gang didn't look up as I passed. One forefinger tapped absently against their temple, the lips pursed and twitched in the characteristic mode that said *internal dialog in progress*. I could never tell who was on top when they were like that.

I sucked on the squeezebulb and looked in on the pens. Two cubes suffused in pale red light: in one a scrambler floated center stage, waving its segmented arms like seaweed in gentle surge. The occupant of the other cage was squeezed into a corner, four arms splayed across the converging walls; four others extended, waving again, into open space. The bodies from which those arms sprouted were spheroids, not flattened disks as our first—sample had been. They were only slightly compressed, and their arms sprouted not from a single

equatorial band but from across the whole surface.

Fully-extended, the floating scrambler was over two meters across. The other seemed roughly the same size. Neither moved, except for those drifting arms. Navy-blue mosaics, almost black in the longwave, rippled across their surfaces like the patterns of wind on grass. Superimposed graphics plotted methane and hydrogen at reassuring *Rorschach* norms. Temperature and lighting, ditto. An icon for ambient electromagnetics remained dark.

I dipped into the archives, watched the arrival of the aliens from two days past; each tumbling unceremoniously into its pen, balled up, hugging themselves as they bounced gently around their enclosures. *Fetal position*, I thought—but after a few moments the arms uncoiled, like the blooming of calcareous flowers.

"Robert says *Rorschach* grows them," Susan James said behind me.

I turned. Definitely James in there, but—muted, somehow. Her meal remained untouched. Her surfaces were dim.

Except for the eyes. Those were deep, and a little hollow.

"Grows?" I repeated.

"In stacks. They have two navels each." She managed a weak smile, touched her belly with one hand and the small of her back with the other. "One in front, one behind. He thinks they grow in a kind of column, piled up. When the top one develops to a certain point, it buds off from the stack and becomes free-living."

The archived scramblers were exploring their new environment now, climbing gingerly along the walls, unrolling their arms along the corners where the panels met. Those swollen central bodies struck me again. "So that first one, with the flattened..."

"Juvenile," she agreed. "Fresh off the stack. These ones are older. They, they plump out as they mature. Robert says," she added after a moment.

I sucked the dregs from my squeezebulb. "The ship grows its own crew."

"If it's a ship." James shrugged. "If they're crew."

I watched them move. There wasn't much to explore; the walls were almost bare, innocent of anything but a few sensor heads and gas nozzles. The pens had their own tentacles and manipulators for more invasive research needs, but those had been carefully sheathed during introduction. Still, the creatures covered the territory in careful increments, moving back and forth along parallel, invisible paths. Almost as if they were running transects.

James had noticed it too. "It seems awfully systematic, doesn't it?"

"What does Robert say about that?"

"He says the behavior of honeybees and sphex wasps is just as complex, and it's all rote hardwiring. Not intelligence."

"But bees still *communicate*, right? They do that dance, to tell the hive where the flowers are."

She shrugged, conceding the point.

"So you still might be able to talk to these things."

"Maybe. You'd think." She massaged her brow between thumb and forefinger. "We haven't got anywhere, though. We played some of their pigment patterns back to them, with variations. They don't seem to make sounds. Robert synthesized a bunch of noises that they might squeeze out of their cloacae if they were so inclined, but those didn't get us anywhere either. Harmonic farts, really."

"So we're sticking to the blood-cells-with-waldoes model."

"Pretty much. But you know, they didn't go into a loop. Hardwired animals repeat themselves. Even smart ones pace, or chew their fur. Stereotyped behaviors. But these two, they gave everything a very careful once-over and then just—shut down."

They were still at it in ConSensus, slithering across one wall, then another, then another, a slow screw-thread track that would leave no square centimeter uncovered.

"Have they done anything since?" I asked.

She shrugged again. "Nothing spectacular. They squirm when you poke them. Wave their arms back and forth—they do that pretty much constantly, but there's no information in it that we

can tell. They haven't gone invisible on us or anything. We blanked the adjoining wall for a while so they could see each other, even piped audio and air feeds—Robert thought there might be some kind of pheromonal communication—but nothing. They didn't even react to each other."

"Have you tried, well, *motivating* them?"

"With what, Siri? They don't seem to care about their own company. We can't bribe them with food unless we know what they eat, which we don't. Robert says they're in no immediate danger of starvation anyway. Maybe when they get hungry they can deal."

I killed the archival feed and reverted to realtime. "Maybe they eat—I don't know, radiation. Or magnetic energy. The cage can generate magnetic fields, right?"

"Tried it." She took a breath, then squared her shoulders. "But I guess these things take time. He's only had a couple of days, and I only got out of the crypt myself a day ago. We'll keep trying."

"What about negative reinforcement?" I wondered.

She blinked. "Hurt them, you mean."

"Not necessarily anything extreme. And if they're not sentient anyway..."

Just like that, Susan went away. "Why, Keeton. you just made a *suggestion*. You giving up on this whole *noninterference* thing?"

"Hello, Sascha. No, of course not. Just—making a list of what's been tried."

"Good." There was an edge to her voice. "Hate to think you were slipping. We're going to grab some down time now, so maybe you could go and talk to Cunningham for a bit. Yeah, do that."

"And be sure to tell him your theory about radiation-eating aliens. I bet he could use a laugh."

He stood at his post in BioMed, though his empty chair was

barely a meter away. The ubiquitous cigarette hung from between the fingers of one hand, burned down and burned out. His other hand played with itself, fingers tapping against thumb in sequence, little to index, index to little. Windows crawled with intelligence in front of him; he wasn't watching.

I approached from behind. I watched his surfaces in motion. I heard the soft syllables rising from his throat:

"*Yit-barah v'yish-tabah v'yit-pa-ar v'yit-romam...*"

Not his usual litany. Not even his usual language; Hebrew, ConSensus said.

It sounded almost like a *prayer*...

He must have heard me. His topology went flat and hard and almost impossible to decipher. It was increasingly difficult getting a fix on anyone these days, but even through those topological cataracts Cunningham— as always— was a tougher read than most.

"Keeton," he said without turning.

"You're not Jewish," I said.

"*It was.*" *Szpindel*, I realized after a moment. Cunningham didn't do gender pronouns.

But Isaac Szpindel had been an atheist. All of us were. We'd all started out that way, at least.

"I didn't know you knew him," I said. It certainly wasn't policy.

Cunningham sank into his chair without looking at me. In his head, and in mine, a new window opened within a frame marked *Electrophoresis*.

I tried again. "I'm sorry. I didn't mean to intru—"

"What can I do for you, Siri?"

"I was hoping you could bring me up to speed on your findings."

A periodic chart of alien elements scrolled through the feed. Cunningham logged it and started another sample. "I've documented everything. It's all in ConSensus."

I made a play for ego: "It would really help to know how *you'd* thumbnail it, though. What you think is important can be just as vital as the data themselves."

He looked at me a moment. He muttered something, repetitive and irrelevant.

"What's important is what's *missing*," he said after a moment. "I've got good samples now and I still can't find the genes. Protein synthesis is almost prionic—reconformation instead of the usual transcription pathways—but I can't figure out how those bricks get slotted into the wall once they're made."

"Any progress on the energy front?" I asked.

"Energy?"

"Aerobic metabolism on an anaerobe budget, remember? You said they had too much ATP."

"That I solved." He puffed smoke; far to stern a fleck of alien tissue liquefied and banded into chemical strata. "They're sprinting."

Rotate that if you can.

I couldn't. "How do you mean?"

He sighed. "Biochemistry is a tradeoff. The faster you synthesize ATP, the more expensive each molecule becomes. It turns out scramblers are a lot more energy-efficient at making it than we are. They're just extremely slow at it, which might not be a big drawback for something that spends most of its time inactive. *Rorschach*— whatever *Rorschach* started out as— could have drifted for millennia before it washed up here. That's a lot of time to build up an energy reserve for bouts of high activity, and once you've laid the groundwork glycolysis is *explosive*. Two-thousand-fold boost, and no oxygen demand."

"Scramblers *sprint*. Their whole lives."

"They may come preloaded with ATP and burn it off throughout their lifespan."

"How long would that be?"

"Good question," he admitted. "Live fast, die young. If they ration it out, stay dormant most of the time—who knows?"

"Huh." The free-floating scrambler had drifted away from the center of its pen. One extended arm held a wall at bay; the others continued their hypnotic swaying.

I remembered other arms, their motion not so gentle.

"Amanda and I chased one into a crowd. It—"

Cunningham was back at his samples. "I saw the record."

"They tore it to pieces."

"Uh huh."

"Any idea why?"

He shrugged. "Bates thought there might be some kind of civil war going on down there."

"What do you think?"

"I don't know. Maybe it's right, or maybe scramblers are ritual cannibals, or—they're *aliens*, Keeton. What do you want from me?"

"But they're not *really* aliens. At least not intelligent ones. *War* implies intelligence."

"Ants wage war all the time. Proves nothing except that they're alive."

"Are *scramblers* even alive?" I asked.

"What kind of question is that?"

"You think *Rorschach* grows them on some kind of assembly line. You can't find any genes. Maybe they're just biomechanical machines."

"That's what life *is*, Keeton. That's what *you* are." Another hit of nicotine, another storm of numbers, another sample. "Life isn't either/or. It's a matter of degree."

"What I'm asking is, are they *natural*? Could they be constructs?"

"Is a termite mound a construct? Beaver dam? Space ship? Of course. Were they built by naturally-evolved organisms, acting naturally? They were. So tell me how anything in the whole deep multiverse can ever be anything *but* natural?"

I tried to keep the irritation out of my voice. "You know what I mean."

"It's a meaningless question. Get your head out of the Twentieth Century."

I gave up. After a few seconds Cunningham seemed to notice the silence. He withdrew his consciousness from the machinery and looked around with fleshly eyes, as if searching for some mosquito that had mysteriously stopped whining.

"What's your problem with me?" I asked. Stupid question,

obvious question. Unworthy of any synthesist to be so, so *direct*.

His eyes glittered in that dead face. "Processing without comprehension. That's what you do, isn't it?"

"That's a colossal oversimplification."

"Mmm." Cunningham nodded. "Then why can't you seem to *comprehend* how pointless it is to keep peeking over our shoulders and writing home to our masters?"

"Someone has to keep Earth in the loop."

"Seven months each way. Long loop."

"Still."

"We're on our own out here, Keeton. *You're* on your own. The game's going to be long over before our masters even know it's started." He sucked smoke. "Or perhaps not. Perhaps you're talking to someone closer, hmm? That it? Is the Fourth Wave telling you what to do?"

"There is no Fourth Wave. Not that anyone's told me, anyway."

"Probably not. They'd never risk *their* lives out here, would they? Too dangerous even to hang back and watch from a distance. That's why they built *us*."

"We're all self-made. Nobody forced you to get the rewire."

"No, nobody *forced* me to get the rewire. I could have just let them cut out my brain and pack it into Heaven, couldn't I? That's the *choice* we have. We can be utterly useless, or we can try and compete against the vampires and the constructs and the AIs. And perhaps *you* could tell me how to do that without turning into a—an utter freak."

So much in the voice. Nothing at all on the face. I said nothing.

"See what I mean? No comprehension." He managed a tight smile. "So I'll answer your questions. I'll delay my own work and hold your hand because Sarasti's told us to. I guess that superior vampire mind sees some legitimate reason to indulge your constant ankle-nipping, and it's in charge so I'll play along. But I'm not nearly that smart, so you'll forgive me if it all seems a bit naff."

"I'm just—"

"You're just doing your job. I know. But I don't like being *played*, Keeton. And that's what your job is."

Even back on Earth, Robert Cunningham had barely disguised his opinion of the ship's *commissar*. It had been obvious even to the topologically blind.

I'd always had a hard time imagining the man. It wasn't just his expressionless face. Sometimes, not even the subtler things behind would show up in his topology. Perhaps he repressed them deliberately, resenting the presence of this mole among the crew.

It would hardly have been the first time I'd encountered such a reaction. Everyone resented me to some extent. Oh, they liked me well enough, or thought they did. They tolerated my intrusions, and cooperated, and gave away far more than they thought they did.

But beneath Szpindel's gruff camaraderie, beneath James's patient explanations—there was no real respect. How could there be? These people were the bleeding edge, the incandescent apex of hominid achievement. They were trusted with the fate of the world. I was just a tattletale for small minds back home. Not even that much, when home receded too deeply into the distance. Superfluous mass. Couldn't be helped. No use getting bothered over it.

Still, Szpindel had only coined *commissar* half-jokingly. Cunningham *believed* it, and didn't laugh. And while I'd encountered many others like him over the years, those had only *tried* to hide themselves from sight. Cunningham was the first who seemed to succeed.

I tried to build the relationship all the way through training, tried to find the missing pieces. I watched him working the simulator's teleops one day, exercising the shiny new interfaces that spread him through walls and wires. He was practicing his surgical skills on some hypothetical alien the computer had

conjured up to test his technique. Sensors and jointed teleops sprouted like the legs of an enormous spider crab from an overhead mount. Spirit-possessed, they dipped and weaved around some semiplausible holographic creature. Cunningham's own body merely trembled slightly, a cigarette jiggling at the corner of its mouth.

I waited for him to take a break. Eventually the tension ebbed from his shoulders. His vicarious limbs relaxed.

"So." I tapped my temple. "Why'd *you* do it?"

He didn't turn. Above the dissection, sensors swiveled and stared back like dismembered eyestalks. *That* was the center of Cunningham's awareness right now, not this nicotine-stained body in front of me. *Those* were his eyes, or his tongue, or whatever unimaginable bastard-senses he used to parse what the machines sent him. Those clusters aimed back at me, at *us*—and if Robert Cunningham still possessed anything that might be called vision, he was watching himself from eyes two meters outside his own skull.

"Do what, exactly?" he said at last. "The enhancements?"

Enhancements. As though he'd upgraded his wardrobe instead of ripping out his senses and grafting new ones into the wounds.

I nodded.

"It's vital to keep current," he said. "If you don't reconfigure you can't retrain. If you don't retrain you're obsolete inside a month, and then you're not much good for anything except Heaven or dictation."

I ignored the jibe. "Pretty radical transformation, though."

"Not these days."

"Didn't it *change* you?"

His body dragged on the cigarette. Targeted ventilation sucked away the smoke before it reached me. "That's the whole point."

"Surely you were affected personally, though. Surely—"

"Ah." He nodded; at the far end of shared motor nerves, teleops jiggled in sympathy. "Change the eyes that look at the world, change the *me* does the looking?"

"Something like that."

Now he was watching me with fleshly eyes. Across the membrane those snakes and eyestalks returned to their work on the virtual carcass, as if deciding they'd wasted enough time on pointless distractions. I wondered which body he was in now.

"I'm surprised you'd have to ask," the meat one said. "Doesn't my body language tell you everything? Aren't jargonauts supposed to read minds?"

He was right, of course. I wasn't interested in Cunningham's *words*; those were just the carrier wave. He couldn't hear the *real* conversation we were having. All his angles and surfaces spoke volumes, and although their voices were strangely fuzzed with feedback and distortion I knew I'd be able to understand them eventually. I only had to keep him talking.

But Jukka Sarasti chose that moment to wander past and surgically trash my best-laid plans.

"Siri's best in his field," he remarked. "But not when it gets too close to home."

WHY SHOULD MAN EXPECT HIS PRAYER FOR MERCY TO
BE HEARD BY WHAT IS ABOVE HIM WHEN HE SHOWS NO
MERCY TO WHAT IS UNDER HIM?

—PIERRE TROUBETZKOY

"THE THING IS," Chelsea said, "this whole first-person thing takes *effort*. You have to care enough to *try*, you know? I've been working my ass off on this relationship, I've been working so hard, but you just don't seem to *care*..."

She thought she was breaking the news. She thought I hadn't seen it coming, because I hadn't said anything. I'd probably seen it before she had. I hadn't said anything because I'd been scared of giving her an opening.

I felt sick to my stomach.

"I care about you," I said.

"As much as you could care about anything," she admitted. "But you—I mean, sometimes you're fine, Cygnus, sometimes you're wonderful to be around but whenever anything gets the least bit intense you just go away and leave this, this *battle computer* running your body and I just can't *deal* with it any more..."

I stared at the butterfly on the back of her hand. Its wings flexed and folded, lazy and iridescent. I wondered how many of those tattoos she had; I'd seen five of them on different body parts, albeit only one at a time. I thought about asking her, but this didn't seem like the right moment.

"You can be so—so brutal sometimes," she was saying. "I know you don't mean to be, but... I don't know. Maybe I'm your pressure-release valve, or something. Maybe you have to submerge yourself so much on the job that everything just, just builds up and you need some kind of punching bag. Maybe that's why you say the things you do."

She was waiting for me to say something now. "I've been honest," I said.

"Yeah. Pathologically. Have you ever had a negative thought that you *haven't* said out loud?" Her voice trembled but her eyes—for once—stayed dry. "I guess it's as much my fault as yours. Maybe more. I could tell you were—disconnected, from the day we met. I guess on some level I always saw it coming."

"Why even try, then? If you knew we were just going to crash and burn like this?"

"Oh, Cygnus. Aren't you the one who says that *everyone* crashes and burns eventually? Aren't you the one who says it *never* lasts?"

Mom and Dad lasted. Longer than this, anyway.

I frowned, astonished that I'd even let the thought form in my head. Chelse read the silence as a wounded one. "I guess—maybe I thought I could help, you know? Help fix whatever made you so—so *angry* all the time."

The butterfly was starting to fade. I'd never seen that happen before.

"Do you understand what I'm saying?" she asked.

"Sure. I'm a fixer-upper."

"Siri, you wouldn't even get a tweak when I offered. You were so scared of being *manipulated* you wouldn't even try a basic cascade. You're the one guy I've met who might be truly, eternally unfixable. I dunno. Maybe that's even something to be proud of."

I opened my mouth, and closed it.

She gave me a sad smile. "Nothing, Siri? Nothing at all? There was a time you always knew exactly what to say." She looked back at some earlier version of me. "Now I wonder if you ever actually meant any of it."

"That's not fair."

"No." She pursed her lips. "No, it isn't. That's not really what I'm trying to say. I guess...it's not so much that you don't *mean* any of it. It's more like you don't know what any of it *means*."

The color was gone from the wings. The butterfly was a delicate charcoal dusting, almost motionless.

"I'll do it now," I said. "I'll get the tweaks. If it's that important to you. I'll do it now."

"It's too late, Siri. I'm used up."

Maybe she wanted me to call her back. All these words ending in question marks, all these significant silences. Maybe she was giving me the opportunity to plead my case, to beg for another chance. Maybe she wanted a reason to change her mind.

I could have tried. *Please don't*, I could have said. *I'm begging you. I never meant to drive you away completely, just a little, just to a safer distance. Please. In thirty long years the only time I haven't felt worthless was when we were together.*

But when I looked up again the butterfly was gone and so was she, taking all baggage with her. She carried doubt, and guilt for having led me on. She left believing that our incompatibility was no one's fault, that she'd tried as hard as she could, even that *I* had under the tragic weight of all my issues. She left, and maybe she didn't even blame me, and I never even knew who'd made that final decision.

I was good at what I did. I was so damned good, I did it without even meaning to.

"My God! Did you hear that!?"

Susan James bounced around the drum like a pronking wildebeest in the half-gravity. I could see the whites of her eyes from ninety degrees away. "Check your feeds! Check your feeds! *The pens!*"

I checked. One scrambler afloat; the other still jammed into its corner.

James landed at my side with a two-footed thump, wobbling for balance. "Turn the sound up!"

The hissing of the air conditioners. The clank of distant machinery echoing along the spine; *Theseus'* usual intestinal rumblings. Nothing else.

"Okay, they're not doing it now." James brought up a splitscreen window and threw it into reverse. "*There,*" she pronounced, replaying the record with the audio cranked and filtered.

In the right side of the window, the floating scrambler had drifted so that the tip of one outstretched arm brushed against the wall that adjoined the other pen. In the left side, the huddled scrambler remained unmoving.

I thought I heard something. Just for an instant: the brief buzz of an insect, perhaps, if the nearest insect hadn't been five trillion kilometers away.

"Replay that. Slow it down."

A buzz, definitely. A vibration.

"Way down."

A click train, squirted from a dolphin's forehead. Farting lips.

"No, let *me*." James bulled into Cunningham's headspace and yanked the slider to the left.

Tick tick...tick...tick tick tick...tick...tick tick tick...

Dopplered down near absolute zero, it went on for almost a

minute. Total elapsed real time was about half a second.

Cunningham zoomed the splitscreen. The huddled scrambler had remained motionless, except for the rippling of its cuticle and the undulation of its free arms. But before I'd only seen eight arms—and now I could make out the bony spur of a ninth peeking from behind the central mass. A ninth arm, curled up and hidden from view, *tick tick ticking* while another creature casually leaned against the other side of the wall...

Now, there was nothing. The floating scrambler had drifted aimlessly back to the center of its enclosure.

James's eyes shone. "We've got to check the rest of—"

But *Theseus* had been watching, and was way ahead of us. It had already searched the archives and served up the results: three similar exchanges over two days, ranging in duration from a tenth of a second to almost two.

"They're talking," James said.

Cunningham shrugged, a forgotten cigarette burning down between his fingers. "So do a lot of things. And at *that* rate of exchange they're not exactly doing calculus. You could get as much information out of a dancing honeybee."

"That's nonsense and you know it, Robert."

"What I *know* is that—"

"Honeybees don't deliberately hide what they're saying. Honeybees don't develop whole new modes of communication configured specifically to confound observers. That's flexible, Robert. That's *intelligent*."

"And what if it is, hmm? Forget for a moment the inconvenient fact that these things don't even have *brains*. I really don't think you've thought this through."

"Of course I have."

"Indeed? Then what are you so happy about? Don't you know what this means?"

Sudden prickling on the back of my neck. I looked around; I looked *up*. Jukka Sarasti had appeared in the center of the drum, eyes gleaming, teeth bared, watching us.

Cunningham followed my gaze, and nodded. "I'd wager *it* does..."

There was no way to learn what they'd whispered across that wall. We could recover the audio easily enough, parse every tick and tap they'd exchanged, but you can't decipher a code without some idea of *content*. We had patterns of sound that could have meant anything. We had creatures whose grammar and syntax—if their mode of communication even contained such attributes—were unknown and perhaps unknowable. We had creatures smart enough to talk, and smart enough to hide that fact. No matter how much we wanted to learn, they were obviously unwilling to teach us.

Not without—how had I put it?— *negative reinforcement*.

It was Jukka Sarasti who made the decision. We did it on his orders, as we did everything else. But after the word had come down— after Sarasti had disappeared in the night and Bates had retreated down the spine and Robert Cunningham had returned to his studies at the back of the drum—I was the one Susan James was left with. The first to speak the vile thought aloud, the official witness to posterity. I was the one she looked at, and looked away from, her surfaces hard and refractory.

And then she started.

This is how you break down the wall:

Start with two beings. They can be human if you like, but that's hardly a prerequisite. All that matters is that they know how to talk among themselves.

Separate them. Let them see each other, let them speak. Perhaps a window between their cages. Perhaps an audio feed. Let them practice the art of conversation in their own chosen way.

Hurt them.

It may take a while to figure out how. Some may shrink from fire, others from toxic gas or liquid. Some creatures may be

invulnerable to blowtorches and grenades, but shriek in terror at the threat of ultrasonic sound. You have to experiment; and when you discover just the right stimulus, the optimum balance between *pain* and *injury*, you must inflict it without the remorse.

You leave them an escape hatch, of course. That's the very point of the exercise: give one of your subjects the *means* to end the pain, but give the other the *information* required to use it. To one you might present a single shape, while showing the other a whole selection. The pain will stop when the being with the menu chooses the item its partner has seen. So let the games begin. Watch your subjects squirm. If—*when*—they trip the off switch, you'll know at least some of the information they exchanged; and if you record everything that passed between them, you'll start to get some idea of how they exchanged it.

When they solve one puzzle, give them a new one. Mix things up. Switch their roles. See how they do at circles versus squares. Try them out on factorials and Fibonnaccis. Continue until Rosetta Stone results.

This is how you communicate with a fellow intelligence: you hurt it, and keep on hurting it, until you can distinguish the speech from the screams.

Susan James—congenital optimist, high priestess of the Church of the Healing Word, was best qualified to design and execute the protocols. Now, at her command, the scramblers writhed. They pulled themselves around their cages in elliptical loops, desperately seeking any small corner free of stimulus. James had piped the feed into ConSensus, although there was no mission-critical reason for *Theseus'* whole crew to bear witness to the interrogation.

"Let them block it at their ends," she said quietly, "If they want to."

For all his reluctance to accept that these were *beings*, intelligent and aware, Cunningham had named the prisoners. *Stretch* tended to float spread-eagled; *Clench* was the balled-up corner-hugger. Susan, playing her own part in this perverse role-reversal, had simply numbered them One and Two. It

wasn't that Cunningham's choices were too cheesy for her to stomach, or that she objected to slave names on principle. She'd just fallen back on the oldest trick in the Torturer's Handbook, the one that lets you go home to your family after work, and play with your children, and sleep at night: *never* humanize your victims.

It shouldn't have been such an issue when dealing with methane-breathing medusae. I guess every little bit helped.

Biotelemetry danced across the headspace beside each alien, luminous annotations shuddering through thin air. I had no idea what constituted normal readings for these creatures, but I couldn't imagine those jagged spikes passing for anything but bad news. The creatures themselves seethed subtly with fine mosaics in blue and gray, fluid patterns rippling across their cuticles. Perhaps it was a reflexive reaction to the microwaves; for all we knew it was a mating display.

More likely they were screaming.

James killed the microwaves. In the left-hand enclosure, a yellow square dimmed; in the right, an identical icon nested among others had never lit.

The pigment flowed faster in the wake of the onslaught; the arms slowed but didn't stop. They swept back and forth like listless, skeletal eels.

"Baseline exposure. Five seconds, two hundred fifty Watts." She spoke for the record. Another affectation; *Theseus* recorded every breath on board, every trickle of current to five decimal places.

"Repeat."

The icon lit up. More tile patterns, flash-flooding across alien skin. But this time, neither alien moved from where it was. Their arms continued to squirm slightly, a torqued trembling variation on the undulation they effected at rest. The telemetry was as harsh as ever, though.

They learned helplessness fast enough, I reflected.

I glanced at Susan. "Are you going to do this all yourself?"

Her eyes were bright and wet as she killed the current. Clench's icon dimmed. Stretch's remained dormant.

I cleared my throat. "I mean—"

"Who else is going to do this, Siri? Jukka? You?"

"The rest of the Gang. Sascha could—"

"Sascha?" She stared at me. "Siri, I *created* them. Do you think I did that so I could *hide* behind them when—so I could force them to do things like *this*?" She shook her head. "I'm not bringing them out. Not for this. I wouldn't do that to my worst enemy."

She turned away from me. There were drugs she could have taken, neuroinhibitors to wash away the guilt, short-circuit it right down in the molecules. Sarasti had offered them up as if he were tempting some solitary messiah in the desert. James had refused him, and would not say why.

"Repeat," she said.

The current flickered on, then off.

"Repeat," she said again.

Not a twitch.

I pointed. "I see it," she said.

Clench had pressed the tip of one arm against the touchpad. The icon there glowed like a candle flame.

Six and a half minutes later they'd graduated from yellow squares to time-lapsed four-dimensional polyhedrons. It took them as long to distinguish between two twenty-six-faceted shifting solids—differing by one facet in a single frame—as it took them to tell the difference between a yellow square and a red triangle. Intricate patterns played across their surfaces the whole time, dynamic needlepoint mosaics flickering almost too fast to see.

"*Fuck*," James whispered.

"Could be splinter skills." Cunningham had joined us in ConSensus, although his body remained halfway around BioMed.

"Splinter skills," she repeated dully.

"Savantism. Hyperperformance at one kind of calculation doesn't necessarily connote high intelligence."

"I know what splinter skills are, Robert. I just think you're wrong."

"Prove it."

So she gave up on geometry and told the scramblers that one plus one equaled two. Evidently they knew that already: ten minutes later they were predicting ten-digit prime numbers on demand.

She showed them a sequence of two-dimensional shapes; they picked the next one in the series from a menu of subtly-different alternatives. She denied them multiple choice, showed them the beginning of a whole new sequence and taught them to draw on the touch-sensitive interface with the tips of their arms. They finished that series in precise freehand, rendered a chain of logical descendants ending with a figure that led inexorably back to the starting point.

"These aren't *drones*," James's voice caught in her throat.

"This is all just crunching," Cunningham said. "Millions of computer programs do it without ever waking up."

"They're *intelligent*, Robert. They're smarter than us. Maybe they're smarter than *Jukka*. And we're—why can't you just *admit* it?"

I could see it all over her: *Isaac* would have admitted it.

"Because they don't have the circuitry," Cunningham insisted. "How could—"

"*I don't know how!*" she cried. "That's *your* job! All *I* know is that I'm torturing beings that can think rings around us..."

"Not for much longer, at least. Once you figure out the language—"

She shook her head. "Robert, I haven't a *clue* about the language. We've been at it for—for hours, haven't we? The Gang's all here, language databases four thousand years thick, all the latest linguistic algorithms. And we know exactly what they're saying, we're watching every possible way they could be *saying* it. Right down to the Angstrom."

"Precisely. So—"

"I've got *nothing*. I know they're talking through pigment mosaics. There might even be something in the way they move those bristles. But I can't find the *pattern*, I can't even follow how they *count*, much less tell them I'm...sorry..."

Nobody spoke for a while. Bates watched us from the galley on our ceiling, but made no attempt to join the proceedings. On ConSensus the reprieved scramblers floated in their cages like multiarmed martyrs.

"Well," Cunningham said at last, "since this seems to be the day for bad news, here's mine. They're dying."

James put her face in her hand.

"It's not your interrogation, for whatever that's worth," the biologist continued. "As far as I can determine, some of their metabolic pathways are just *missing*."

"Obviously you just haven't found them yet." That was Bates, speaking up from across the drum.

"No," Cunningham said, slowly and distinctly, "*obviously* those parts aren't available to the organism. Because they're falling apart pretty much the same way you'd expect one of *us* to, if—all the mitotic spindles in our cells just *vanished* out of the cytoplasm, for example. As far as I can tell they started deteriorating the moment we took them off *Rorschach*."

Susan looked up. "Are you saying they left part of their biochemistry *behind*?"

"Some essential nutrient?" Bates suggested. "They're not eating—"

"Yes to the linguist. No to the major." Cunningham fell silent; I glanced across the drum to see him sucking on a cigarette. "I think a lot of the cellular processes in these things are mediated externally. I think the reason I can't find any genes in my biopsies is because they don't *have* any."

"So what do they have instead?" Bates asked.

"Turing morphogens."

Blank looks, subtitled looks. Cunningham explained anyway: "A lot of biology doesn't use genes. Sunflowers look the way they do because of purely physical buckling stress. You get Fibonacci sequences and Golden ratios everywhere in nature,

and there's no gene that codes for them; it's all just mechanical interactions. Take a developing embryo—the genes say *start growing* or *stop growing*, but the number of digits and vertebrae result from the mechanics of cells bumping against other cells. Those mitotic spindles I mentioned? Absolutely essential for replication in every eukaryotic cell, and they accrete like crystals without any genetic involvement. You'd be surprised how much of life is like that."

"But you still need *genes*," Bates protested, walking around to join us.

"Genes just establish the starting conditions to enable the process. The structure that proliferates afterwards doesn't need specific instructions. It's classic emergent complexity. We've known about it for over a century." Another drag on the stick. "Or even longer. Darwin cited honeycomb way back in the eighteen hundreds."

"Honeycomb," Bates repeated.

"Perfect hexagonal tubes in a packed array. Bees are hardwired to lay them down, but how does an insect know enough geometry to lay down a precise hexagon? It doesn't. It's programmed to chew up wax and spit it out while turning on its axis, and that generates a circle. Put a bunch of bees on the same surface, chewing side-by-side, and the circles abut against each other—deform each other into hexagons, which just happen to be more efficient for close packing anyway."

Bates pounced: "But the *bees* are programmed. *Genetically*."

"You misunderstand. Scramblers are the *honeycomb*."

"*Rorschach* is the bees," James murmured.

Cunningham nodded. "*Rorschach* is the bees. And I don't think *Rorschach's* magnetic fields are counterintrusion mechanisms at all. I think they're part of the life-support system. I think they mediate and regulate a good chunk of scrambler metabolism. What we've got back in the hold is a couple of creatures dragged out of their element and holding their breath. And they can't hold it forever."

"How long?" James asked.

"How should I know? If I'm right, I'm not even dealing with

complete organisms here."

"Guess," Bates said.

He shrugged. "A few days. Maybe."

THAT WHICH DOES NOT KILL US, MAKES US STRANGER.

—TREVOR GOODCHILD

"YOU STILL DON'T vote," Sarasti said.

We would not be releasing the prisoners. Too risky. Out here in the endless wastelands of the Oort there was no room for *live and let live*. Never mind what the Other *has* done, or what it *hasn't*: think of what it *could* do, if it were just a little stronger. Think of what it *might* have done, if we'd arrived as late as we were supposed to. You look at *Rorschach* and perhaps you see an embryo or a developing child, alien beyond comprehension perhaps but not *guilty*, not by default. But what if those are the wrong eyes? What if you should be seeing an omnipotent murdering God, a planet-killer, not yet finished? Vulnerable only now, and for a little longer?

There was no vampire opacity to that logic, no multidimensional black boxes for humans to shrug at and throw up their hands. There was no excuse for the failure to find fault with Sarasti's reasoning, beyond the fact that his reasoning was without fault. That made it worse. The others, I knew, would rather have had to take something on faith.

But Sarasti had an alternative to capture-release, one he evidently considered much safer. It took an act of faith to accept *that* reasoning, at least; by any sane measure it verged on suicide.

Now *Theseus* gave birth by Caesarian. These progeny were far too massive to fit through the canal at the end of the spine. The ship shat them as if constipated, directly into the hold: great monstrous things, bristling with muzzles and antennae. Each stood three or four times my height, a pair of massive rust-

colored cubes, every surface infested with topography. Armor plating would hide most of it prior to deployment, of course. Ribbons of piping and conduit, ammunition reservoirs and shark-toothed rows of radiator fins— all to disappear beneath smooth reflective shielding. Only a few island landmarks would rise above that surface: comm ports, thrust nozzles, targeting arrays. And gun ports, of course. These things spat fire and brimstone from a half-dozen mouths apiece.

But for the time being they were just giant mechanical fetuses, half-extruded, their planes and angles a high-contrast jigsaw of light and shadow in the harsh white glow of the hold's floodlamps.

I turned from the port. "That's got to take our substrate stockpiles down a bit."

"Shielding the carapace was worse." Bates monitored construction through a dedicated flatscreen built right into the Fab bulkhead. Practicing, perhaps; we'd be losing our inlays as soon as the orbit changed. "We're tapping out, though. Might have to grab one of the local rocks before long."

"Huh." I looked back into the hold. "You think they're necessary?"

"Doesn't matter what I think. You're a bright guy, Siri. Why can't you figure that out?"

"It matters to me. That means it matters to Earth."

Which might mean something, if Earth was calling the shots. Some subtext was legible no matter *how* deep in the system you were.

I tacked to port: "How about Sarasti and the Captain, then? Any thoughts?"

"You're usually a bit more subtle."

That much was true. "It's just, you know Susan was the one that caught Stretch and Clench tapping back and forth, right?"

Bates winced at the names. "So?"

"Well, some might think it odd that *Theseus* wouldn't have seen it first. Since quantum computers are supposed to be so proficient at pattern-matching."

"Sarasti took the quantum modules offline. The onboard's

been running in classical mode since before we even made orbit."

"Why?"

"Noisy environment. Too much risk of decoherence. Quantum computers are finicky things."

"Surely the onboard's shielded. *Theseus* is shielded."

Bates nodded. "As much as feasible. But perfect shielding is perfect blindness, and this is not the kind of neighborhood where you want to keep your eyes closed."

Actually, it was. But I took her point.

I took her other point, too, the one she didn't speak aloud: *And you missed it. Something sitting right there in ConSensus for anyone to see. Top-of-the-line synthesist like you.*

"Sarasti knows what he's doing, I guess," I admitted, endlessly aware that he might be listening. "He hasn't been wrong yet, as far as we know."

"As far as we *can* know," Bates said.

"If you could second-guess a vampire, you wouldn't need a vampire," I remembered.

She smiled faintly. "Isaac was a good man. You can't always believe the PR, though."

"You don't buy it?" I asked, but she was already thinking she'd said too much. I threw out a hook baited with just the right mix of skepticism and deference: "Sarasti *did* know where those scramblers would be. Nailed it almost the meter, out of that whole maze."

"I suppose that might have taken some kind of superhuman logic," she admitted, thinking I was so fucking dumb she couldn't believe it.

"What?" I said.

Bates shrugged. "Or maybe he just realized that since *Rorschach* was growing its own crew, we'd run into more every time we went in. No matter *where* we landed."

ConSensus bleeped into my silence. "Orbital maneuvers starting in five," Sarasti announced. "Inlays and wireless prosthetics offline in ninety. That's all."

Bates shut down the display. "I'm going to ride this out in the

bridge. Illusion of control and all that. You?"

"My tent, I think."

She nodded, and braced to jump, and hesitated.

"By the way," she told me, "yes."

"Sorry?"

"You asked if I thought the emplacements were necessary. Right now I think we need all the protection we can get."

"So you think that *Rorschach* might—"

"Hey, it *already* killed me once. "

She wasn't talking about radiation.

I nodded carefully. "That must have been..."

"Like nothing at all. You couldn't possibly imagine." Bates took a breath and let it out.

"Maybe you don't have to," she added, and sailed away up the spine.

Cunningham and the Gang in BioMed, thirty degrees of arc between them. Each poked their captives in their own way. Susan James stabbed indifferently at a keypad painted across her desktop. Windows to either side looked in on Stretch and Clench.

Cookie-cutter shapes scrolled across the desk as James typed: circles, triskelions, a quartet of parallel lines. Some of them pulsed like abstract little hearts. In his distant pen, Stretch reached out one fraying tentacle and tapped something in turn.

"Any progress?"

She sighed and shook her head. "I've given up trying to understand their language. I'm settling for a pidgin." She tapped an icon. Clench vanished from his window; a hieroglyphic flowchart sprang up in his place. Half the symbols wriggled or pulsed, endlessly repetitive, a riot of dancing doodles. Others just sat there.

"Iconic base." James waved vaguely at the display. "Subject-Verb phrases render as animated versions of noun icons.

They're radially symmetrical, so I array modifiers in a circular pattern around the central subject. Maybe that comes naturally to them."

A new circle of glyphs appeared beneath James's—Stretch's reply, presumably. But something in the system didn't like what it saw. Icons flared in a separate window: a luminous counter flashed 500 WATTS, and held steady. On the screen, Stretch writhed. It reached out with squirming backbone-arms and stabbed repeatedly at its touchpad.

James looked away.

New glyphs appeared. 500 Watts retreated to zero. Stretch returned to its holding pattern; the spikes and jags of its telemetry smoothed.

James let out her breath. "What happened?" I asked.

"Wrong answer." She tapped into Stretch's feed, showed me the display that had tripped it up. A pyramid, a star, simplified representations of a scrambler and of *Rorschach* rotated on the board.

"It was stupid, it was just a—a warm-up exercise, really. I asked it to name the objects in the window." She laughed softly and without humor. "That's the thing about *functional* languages, you know. If you can't point at it, you can't talk about it."

"And what did it say?"

She pointed at Stretch's first spiral: "Polyhedron star *Rorschach* are present."

"It missed the scrambler."

"Got it right the second time. Still, stupid mistake for something that can think rings around a vampire, isn't it?" Susan swallowed. "I guess even scramblers slip up when they're dying."

I didn't know what to say. Behind me, barely audible, Cunningham muttered some two-stroke mantra to himself in an endless loop.

"Jukka says—" Susan stopped, began again: "You know that *blindsight* we get sometimes, in *Rorschach*?"

I nodded, and wondered what Jukka had said.

"Apparently the same thing can happen to the other senses too," she told me. "You can have *blindtouch*, and *blindsmell*, and *blindhearing*..."

"That would be deafness."

She shook her head. "But it isn't really, is it? Any more than *blindsight* is really blindness. *Something* in your head is still taking it all in. Something in the brain is still seeing, and hearing, even if you're not—aware of it. Unless someone forces you to *guess*, or there's some threat. You just get a really strong feeling you should move out of the way, and five seconds later a bus drives over the spot you were standing. You *knew* it was coming, somehow. You just don't know *how* you knew."

"It's wild," I agreed.

"These scramblers—they *know* the answers, Siri. They're intelligent, we *know* they are. But it's almost as though *they* don't know they know, unless you hurt them. As if they've got blindsight spread over every sense."

I tried to imagine it: life without sensation, without any active awareness of one's environment. I tried to imagine existing like that without going mad. "Do you think that's possible?"

"I don't know. It's just a—a metaphor, I guess." She didn't believe that. Or she didn't know. Or she didn't want me to know.

I should have been able to tell. She should have been *clear*.

"At first I just thought they were resisting," she said, "but why *would* they?" She turned bright, begging eyes on me, pleading for an answer.

I didn't have one. I didn't have a clue. I turned away from Susan James, only to find myself facing Robert Cunningham: Cunningham the mutterer, fingers tapping against tabletop interfaces, inner eyes blinded, vision limited now to the pictures ConSensus sketched in airspace or threw against flat surfaces for everyone to see. His face remained as empty of feeling as it had ever been; the rest of his body twitched like a bug in a spiderweb.

He might as well have been. We all might. *Rorschach* loomed

barely nine kilometers away now, so near it might have eclipsed Ben itself if I'd been brave enough to look outside. We had closed to this insane proximity and *parked*. Out there, *Rorschach* grew like a live thing. *In* there, live things grew, budded like jellyfish from some demonic mechanical substrate. Those lethal, vacant corridors we'd crept along, frightened of the shadows planted in our heads—they were probably filling with scramblers right now. All those hundreds of kilometers of twisted tunnels and passages and chambers. Filling with an army.

This was Sarasti's safer alternative. This was the path we'd followed because it would have been *too dangerous* to release the prisoners. We were so deep inside the bow shock that we'd had to shut down our internal augments; while *Rorschach's* magnetosphere was orders of magnitude weaker here than within the structure itself, who knew if the alien might find us too tempting a target—or too great a threat—at this range? Who knew when it might choose to plunge some invisible spike through *Theseus's* heart?

Any pulse that could penetrate the ship's shielding would doubtless fry *Theseus's* nervous system as well as the wiring in our heads. I supposed that five people in a dead ship would have a marginally greater chance of survival if their brains weren't sparking in the bargain, but I doubted that such a difference would *make* much difference. Sarasti had obviously figured the odds differently. He'd even shut down the antiEuclidean pump in his own head, resorted to manual injections to keep *himself* from short-circuiting.

Stretch and Clench were even closer to *Rorschach* than we were. Cunningham's lab had been kicked free of the ship; it floated now just a few kilometers from the artefact's outermost spires, deep within the folds of its magnetic field. If the scramblers needed radioactive magnetite to function, this was the most they were going to get: a taste of the fields, but not of freedom. The lab's shielding was being dynamically fine-tuned to balance medical necessity against tactical risk, as best the data allowed. The structure floated in the watchful crosshairs of

our newborn gun emplacements, strategically positioned to either side. Those emplacements could destroy the hab in an instant. They could probably destroy anything approaching it as well.

They couldn't destroy *Rorschach*, of course. Maybe nothing could.

Covert to invulnerable. As far as we knew that hadn't happened yet. Presumably *Theseus* could still do something about the artefact accreting off our bow, assuming we could decide which thing to do. Sarasti wasn't talking. In fact, I couldn't remember the last time any of us had even *seen* the vampire in the flesh. For several shifts now he had confined himself to his tent, speaking only through ConSensus.

Everyone was on edge, and the transient had gone quiet.

Cunningham muttered to himself, stabbed at unfamiliar controls with unpracticed fingers, cursed his own clumsiness. Stimulus and response flowed through lasers across six kilometers of ionized vacuum. The ever-present nicotine stick hung from one corner of his mouth for want of a free hand. Every now and then flecks of ash broke free and drifted obliquely towards the ventilators.

He spoke before I could. "It's all in ConSensus." When I didn't leave he relented, but wouldn't look at me: "Magnetite flecks lined up as soon as they got past the wavefront, more or less. Membranes started to fix themselves. They're not failing as fast. But it's *Rorschach's internal* environment that will be optimized for scrambler metabolism. Out here, I think the most we can do is slow the rate of dying."

"That's something, at least."

Cunningham grunted. "Some of the pieces are coming together. Others—their nerves are frayed, for no good reason. Literally. Signal leakage along the cables."

"Because of their deterioration?" I guessed.

"And I can't get the Arrhenius equation to balance, there's all this nonlinearity at low temperatures. The preexponential value's completely fucked up. It's almost as though temperature doesn't *matter*, and —*shit*—"

Some critical value had exceeded a confidence limit on one of his displays. He glanced up the drum, raised his voice: "Need another biopsy, Susan. Anywhere central."

"What—oh. Just a second." She shook her head and tapped off a brief spiral of icons, as listless as the captives she commanded. On one of Cunningham's windows Stretch viewed her input with its marvelous sighted skin. It floated unresponsive for a moment. Then it folded back the arms facing one wall, opening a clear path for Cunningham's teleops.

He called two of them from their burrows like prehensile serpents. The first wielded a clinical core-sampler; the second wielded the threat of violence in case of foolish resistance. It was hardly necessary. Blindsighted or not, scramblers were fast learners. Stretch exposed its belly like a victim resigned to imminent rape. Cunningham fumbled; the teleops bumped together, briefly entangled. He cursed and tried again, every move shouting frustration. His extended phenotype had been amputated; once the very ghost in the machine, now he was just another guy punching buttons, and—

—and suddenly, something *clicked*. Cunningham's facades swirled to translucency before my eyes. Suddenly, I could almost *imagine* him.

He got it right the second time. The tip of his machine shot out like a striking snake and darted back again, almost too fast to see. Waves of color flushed from Stretch's injury like ripples chased across still water by a falling stone.

Cunningham must have thought he saw something in my face. "It helps if you try not to think of them as people," he said. And for the very first time I could read the subtext, as clear and sharp as broken glass:

Of course, you don't think of anyone that way...

Cunningham didn't like to be *played*.

No one does. But most people don't think that's what I'm

doing. They don't know how much their bodies betray when they close their mouths. When they speak aloud, it's because they want to confide; when they don't, they think they're keeping their opinions to themselves. I watch them so closely, customize each word so that no system ever feels *used*— and yet for some reason, that didn't work with Robert Cunningham.

I think I was modeling the wrong system.

Imagine you are a synthesist. You deal in the behavior of systems at their surfaces, infer the machinery *beneath* from its reflections *above*. That is the secret of your success: you understand the system by understanding the boundaries that contain it.

Now imagine you encounter someone who has ripped a hole in those boundaries and bled beyond them.

Robert Cunningham's flesh could not contain him. His duties pulled him beyond the meat sack; here in the Oort, his topology rambled all over the ship. That was true of all of us, to some extent; Bates and her drones, Sarasti and his limbic link—even the ConSensus inlays in our heads *diffused* us a bit, spread us just slightly beyond the confines of our own bodies. But Bates only ran her drones; she never *inhabited* them. The Gang of Four may have run multiple systems on a single motherboard, but each had its own distinct topology and they only surfaced one at a time. And Sarasti—

Well, Sarasti was a whole different story, as it turned out.

Cunningham didn't just operate his remotes; he *escaped* into them, wore them like a secret identity to hide the feeble Human baseline within. He had sacrificed half of his neocortex for the chance to see x-rays and taste the shapes hiding in cell membranes, he had butchered one body to become a fleeting tenant of many. Pieces of him hid in the sensors and manipulators that lined the scrambler's cages; I might have gleaned vital cues from every piece of equipment in the subdrum if I'd ever thought to look. Cunningham was a topological jigsaw like everyone else, but half his pieces were hidden in machinery. My model was incomplete.

I don't think he ever aspired to such a state. Looking back, I

see radiant self-loathing on every remembered surface. But there in the waning years of the twenty-first century, the only alternative he could see was the life of a parasite. Cunningham merely chose the lesser evil.

Now, even that was denied him. Sarasti's orders had severed him from his own sensorium. He no longer *felt* the data in his gut; he had to *interpret* it, step by laborious step, through screens and graphs that reduced perception to flat empty shorthand. Here was a system traumatized by multiple amputations. Here was a system with its eyes and ears and tongue cut out, forced to stumble and feel its way around things it had once *inhabited*, right down in the bone. Suddenly there was nowhere else to hide, and all those far-flung pieces of Robert Cunningham tumbled back into his flesh where I could see them at last.

It had been my mistake, all along. I'd been so focused on modelling other systems that I'd forgotten about the one doing the modelling. Bad eyes are only one bane of clear vision: bad assumptions can be just as blinding, and it wasn't enough to imagine I was Robert Cunningham.

I had to imagine I was Siri Keeton as well.

Of course, that only raises another question. If my guess about Cunningham was right, why did my tricks work on Isaac Szpindel? He was every bit as discontinuous as his replacement.

I didn't think about it much at the time. Szpindel was gone but the thing that had killed him was still there, hanging right off the bow, a vast swelling enigma that might choose to squash us at any instant. I was more than a little preoccupied.

Now, though—far too late to do anything about it—I think I might know the answer.

Maybe my tricks didn't work on Isaac either, not really. Maybe he saw through my manipulations as easily as Cunningham did. But maybe he just didn't care. Maybe I could

read him because he *let* me. Which would mean— I can't find another explanation that fits— that he just *liked* me, regardless.

I think that might have made him a friend.

IF I CAN BUT MAKE THE WORDS AWAKE THE FEELING.

—IAN ANDERSON, *STAND UP*

NIGHT SHIFT. NOT a creature was stirring.

Not in *Theseus*, anyway. The Gang hid in their tent. The transient lurked weightless and silent below the surface. Bates was in the bridge— she more or less lived up there now, vigilant and conscientious, nested in camera angles and tactical overlays. There was nowhere she could turn without seeing some aspect of the cipher off our starboard bow. She did what good she could, for the good it would do.

The drum turned quietly, lights dimmed in deference to a diel cycle that a hundred years of tweaks and retrofits hadn't been able to weed from the genes. I sat alone in the galley, squinting from the inside of a system whose outlines grew increasingly hazy, trying to compile my latest—how had Isaac put it?—*postcard to posterity*. Cunningham worked upside-down on the other side of the world.

Except Cunningham wasn't working. He hadn't even moved for at least four minutes. I'd assumed he was reciting the Kaddish for Szpindel—ConSensus said he'd be doing it twice daily for the next year, if we lived that long—but now, leaning to see around the spinal bundles in the core, I could read his surfaces as clearly as if I'd been sitting beside him. He wasn't bored, or distracted, or even deep in thought.

Robert Cunningham was petrified.

I stood and paced the drum. Ceiling turned into wall; wall into floor. I was close enough to hear his incessant soft muttering, a single indistinct syllable repeated over and over; then I was close enough to hear what he was saying—

"fuck fuck fuck fuck..."

—and still Cunningham didn't move, although I'd made no attempt to mask my approach.

Finally, when I was almost at his shoulder, he fell silent.

"You're blind," he said without turning. "Did you know that?"

"I didn't."

"You. Me. Everyone." He interlocked his fingers and *clenched* as if in prayer, hard enough to whiten the knuckles. Only then did I notice: no cigarette.

"Vision's mostly a lie anyway," he continued. "We don't really see anything except a few hi-res degrees where the eye focuses. Everything else is just peripheral blur, just—light and motion. Motion draws the focus. And your eyes *jiggle* all the time, did you know that, Keeton? *Saccades*, they're called. Blurs the image, the movement's way too fast for the brain to integrate so your eye just—shuts down between pauses. It only grabs these isolated freeze-frames, but your brain edits out the blanks and stitches an — an illusion of continuity into your head."

He turned to face me. "And you know what's *really* amazing? If something only moves during the gaps, your brain just—ignores it. It's invisible."

I glanced at his workspace. The usual splitscreen glowed to one side—realtime images of the scramblers in their pens—but Histology, ten thousand times larger than life, took center stage. The paradoxical neural architecture of *Stretch & Clench* glistened on the main window, flensed and labeled and overlaid by circuit diagrams a dozen layers thick. A dense, annotated forest of alien trunks and brambles. It looked a little like *Rorschach* itself.

I couldn't parse any of it.

"Are you listening, Keeton? Do you know what I'm saying?"

"You've figured out why I couldn't—you're saying these things can somehow tell when our eyes are offline, and..."

I didn't finish. It just didn't seem possible.

Cunningham shook his head. Something that sounded disturbingly like a giggle escaped his mouth. "I'm saying these things can see your nerves firing from across the room, and

integrate that into a crypsis strategy, and then send motor commands to *act* on that strategy, and then send other commands to *stop* the motion before your eyes come back online. All in the time it would take a mammalian nerve impulse to make it halfway from your shoulder to your elbow. These things are *fast*, Keeton. Way faster than we could have guessed even from that high-speed whisper line they were using. They're bloody *superconductors*."

It took a conscious effort to keep from frowning. "Is that even possible?"

"Every nerve impulse generates an electromagnetic field. That makes it detectable."

"But *Rorschach's* EM fields are so—I mean, reading the firing of a single optic nerve through all that interference—"

"It's not *interference*. The fields are *part* of them, remember? That's probably how they *do* it."

"So they couldn't do that here."

"You're not *listening*. The trap you set wouldn't have caught anything like that, not unless it *wanted* to be caught. We didn't grab specimens at all. We grabbed *spies*."

Stretch and Clench floated in splitscreen before us, arms swaying like undulating backbones. Cryptic patterns played slowly across their cuticles.

"Supposing it's just—instinct," I suggested. "Flounders hide against their background pretty well, but they don't *think* about it."

"Where are they going to get that instinct *from*, Keeton? How is it going to evolve? Saccades are an accidental glitch in mammalian vision. Where would scramblers have encountered them before now?" Cunningham shook his head. "That thing, that thing Amanda's robot fried—it developed that strategy on its own, *on the spot*. It *improvised*."

The word *intelligent* barely encompassed that kind of improvisation. But there was something else in Cunningham's face, some deeper distress nested inside what he'd already told me.

"What?" I asked.

"It was *stupid*," he said. "The things these creatures can do, it was just *dumb*."

"How do you mean?"

"Well it didn't work, did it? Couldn't keep it up in front of more than one or two of us."

Because people's eyes don't flicker in synch, I realized. Too many witnesses stripped it of cover.

"—many *other* things it could have done," Cunningham was saying. "They could've induced Anton's or, or an agnosia: then we could have tripped over a whole herd of scramblers and it wouldn't even register in our conscious minds. Agnosias happen by *accident*, for God's sake. If you've got the senses and reflexes to hide between someone's saccades, why stop there? Why not do something that *really* works?"

"Why do you think?" I asked, reflexively nondirective.

"I think that first one was—you know it was a juvenile, right? Maybe it was just inexperienced. Maybe it was *stupid*, and it made a bad decision. I think we're dealing with a species so far beyond us that even their retarded *children* can rewire our brains on the fly, and I can't tell you how fucking scared that should make you."

I could see it in his topology. I could hear it in his voice. His nerveless face remained as calm as a corpse.

"We should just kill them now," he said.

"Well, if they're spies, they can't have learned much. They've been in those cages the whole time, except—" *for the way up*. They'd been right next to us the whole trip back...

"These things live and breath EM. Even stunted, even isolated, who knows how much of our tech they could have just read through the *walls*?"

"You've got to tell Sarasti," I said.

"Oh, Sarasti knows. Why do you think he wouldn't let them go?"

"He never said anything about—"

"He'd be *crazy* to fill us in. He keeps sending you *down* there, remember? Do you think for a second he'd tell you what he knows and then set you loose in a labyrinth full of mind-

reading minotaurs? He knows, and he's already got it factored a thousand ways to Sunday." Cunningham's eyes were bright manic points blazing in an expressionless mask. He raised them to the center of the drum, and didn't raise his voice a decibel. "Isn't that right, Jukka?"

I checked ConSensus for active channels. "I don't think he's listening, Robert."

Cunningham's mouth moved in something that would have been a pitying smile if the rest of his face had been able to join in. "He doesn't have to *listen*, Keeton. He doesn't have to spy on us. He just *knows*."

Ventilators, breathing. The almost-subliminal hum of bearings in motion. Then Sarasti's disembodied voice rang forth through the drum.

"Everyone to Commons. Robert wants to share."

Cunningham sat to my right, his plastic face lit from beneath by the conference table. He stared down into that light, rocking slightly. His lips went through the ongoing motions of some inaudible incantation. The Gang sat across from us. To my left Bates kept one eye on the proceedings and another on intelligence from the front lines.

Sarasti was with us only in spirit. His place at the head of the table remained empty. "Tell them," he said.

"We have to get out of h—"

"From the *beginning*."

Cunningham swallowed and started again. "Those frayed motor nerves I couldn't figure out, those pointless cross-connections—they're logic gates. Scramblers *time-share*. Their sensory and motor plexii double as associative neurons during idle time, so every part of the system can be used for cognition when it isn't otherwise engaged. Nothing like it ever evolved on Earth. It means they can do a great deal of processing without a lot of dedicated associative mass, even for an individual."

"So peripheral nerves can think?" Bates frowned. "Can they *remember*?"

"Certainly. At least, I don't see why not." Cunningham pulled a cigarette from his pocket.

"So when they tore that scrambler apart—"

"Not civil war. Data dump. Passing information about *us*, most likely."

"Pretty radical way to carry on a conversation," Bates remarked.

"It wouldn't be their first choice. I think each scrambler acts as a node in a distributed network, when they're in *Rorschach* at least. But those fields would be configured down to the Angstrom, and when we go in with our tech and our shielding and blowing *holes* in their conductors—we bollocks up the network. Jam the local signal. So they resort to a sneakernet."

He had not lit his cigarette. He rolled the filtered end between thumb and forefinger. His tongue flickered between his lips like a worm behind a mask.

Hidden in his tent, Sarasti took up the slack. "Scramblers also use *Rorschach's* EM for metabolic processes. Some pathways achieve proton transfer via heavy-atom tunneling. Perhaps the ambient radiation acts as a catalyst."

"*Tunneling*?" Susan said. "As in *quantum*?"

Cunningham nodded. "Which also explains your shielding problems. Partly, at least."

"But is that even *possible*? I mean, I thought those kind of effects only showed up under cryonic—"

"*Forget* this," Cunningham blurted. "We can debate the biochemistry later, if we're still alive."

"What do we debate instead, Robert?" Sarasti said smoothly.

"For starters, the *dumbest* of these things can look into your head and see what parts of your visual cortex are lighting up. And if there's a difference between that and mind-reading, it's not much of one."

"As long as we stay out of *Rorschach*—"

"That ship has *sailed*. You people have already *been* there. Repeatedly. Who knows what you already did down there for

no better reason than because *Rorschach made you?*"

"Wait a second," Bates objected. "None of us were *puppets* down there. We hallucinated and we went blind and—and crazy even, but we were never *possessed*."

Cunningham looked at her and snorted. "You think you'd be able to fight the strings? You think you'd even *feel* them? I could apply a transcranial magnet to your head right now and you'd raise your middle finger or wiggle your toes or kick Siri here in the sack and then swear on your sainted mother's grave that you only did it because you *wanted* to. You'd dance like a puppet and all the time swear you were doing it of your own free will, and that's just *me*, that's just some borderline OCD with a couple of magnets and an MRI helmet." He waved at the vast unknowable void beyond the bulkhead. Shreds of mangled cigarette floated sideways in front of him. "Do you want to guess what *that* can do? For all we know we've already given them *Theseus'* technical specs, warned them about the Icarus array, and then just decided *of our own free will* to forget it all."

"We can cause those effects," Sarasti said coolly. "As you say. Strokes cause them. Tumors. Random accidents."

"*Random?* Those were *experiments*, people! That was *vivisection*! They let you in so they could take you apart and see what made you tick and you never even *knew* it."

"*So what?*" the vampire snapped invisibly. Something cold and hungry had edged into his voice. Human topologies shivered around the table, skittish.

"There's a blind spot in the center of your visual field," Sarasti pointed out. "You can't see it. You can't see the saccades in your visual timestream. Just two of the tricks you *know* about. Many others."

Cunningham was nodding. "That's my whole *point*. *Rorschach* could be—"

"Not talking about case studies. Brains are survival engines, not truth detectors. If self-deception promotes fitness, the brain lies. Stops noticing— irrelevant things. Truth never matters. Only fitness. By now you don't experience the world as it exists at all. You experience a simulation built from assumptions.

Shortcuts. *Lies*. Whole *species* is agnosiac by default. *Rorschach* does nothing to you that you don't already do to yourselves."

Nobody spoke. It was several silent seconds before I realized what had happened.

Jukka Sarasti had just given us a pep talk.

He could have shut down Cunningham's tirade—could have probably shut down a full-scale mutiny—by just sailing into our midst and baring his teeth. By *looking* at us. But he wasn't trying to frighten us into submission, we were already nervous enough. And he wasn't trying to educate us either, fight fear with fact; the more *facts* any sane person gathered about *Rorschach*, the more fearful they'd become. Sarasti was only trying to keep us *functional*, lost in space on the edge of our lives, facing down this monstrous enigma that might destroy us at any instant for any reason. Sarasti was trying to calm us down: *good meat, nice meat*. He was trying to keep us from falling apart. *There there*.

Sarasti was practicing *psychology*.

I looked around the table. Bates and Cunningham and the Gang sat still and bloodless.

Sarasti sucked at it.

"We have to get out of here," Cunningham said. "These things are way beyond us."

"We've shown more aggression than they have," James said, but there was no confidence in her voice.

"*Rorschach* plays those rocks like marbles. We're sitting in the middle of a shooting gallery. Any time it feels like—"

"It's still growing. It's not finished."

"That's supposed to *reassure* me?"

"All I'm saying is, we don't *know*," James said. "We could have years yet. Centuries."

"We have fifteen days," Sarasti announced.

"Oh *shit*," someone said. Cunningham, probably. Maybe Sascha.

For some reason everyone was looking at me.

Fifteen days. Who knows what had gone into that number? None of us asked aloud. Maybe Sarasti, in another fit of inept

psychology, had made it up on the spur of the moment. Or maybe he'd derived it before we'd even reached orbit, held it back against the possibility—only now expired— that he might yet send us back into the labyrinth. I'd been half blind for half the mission; I didn't know.

But one way or another, we had our Graduation Day.

The coffins lay against the rear bulkhead of the crypt—on what would be the floor during those moments when *up* and *down* held any meaning. We'd slept for years on the way out. We'd had no awareness of time's passage—undead metabolism is far too sluggish even to support dreams—but somehow the body knew when it needed a change. Not one of us had chosen to sleep in our pods once we'd arrived. The only times we'd done so had been on pain of death.

But the Gang had taken to coming here ever since Szpindel had died.

His body rested in the pod next to mine. I coasted into the compartment and turned left without thinking. Five coffins: four open and emptied, one sealed. The mirrored bulkhead opposite doubled their number and the depth of the compartment.

But the Gang wasn't there.

I turned right. The body of Susan James floated back-to-back with her own reflection, staring at an inverse tableau: three sealed sarcophagi, one open. The ebony plaque set into the retracted lid was dark; the others shone with identical sparse mosaics of blue and green stars. None of them changed. There were no scrolling ECGs, no luminous peak-and-valley tracings marked cardio or cns. We could wait here for hours, days, and none of those diodes would so much as twinkle. When you're undead, the emphasis is on the second syllable.

The Gang's topology had said *Michelle* when I'd first arrived, but it was *Susan* who spoke now, without turning. "I never met

her."

I followed her gaze to the name tag one of the sealed pods: *Takamatsu*. The other linguist, the other multiple.

"I met everyone else," Susan continued. "Trained with them. But I never met my own replacement."

They discouraged it. What would have been the point?

"If you want to—" I began.

She shook her head. "Thanks anyway."

"Or any of the others—I can only imagine what Michelle—"

Susan smiled, but there was something cold about it. "Michelle doesn't really want to talk to you right now, Siri."

"Ah." I hesitated for a moment, to give anyone else a chance to speak up. When nobody did, I pushed myself back towards the hatch. "Well, if any of you change—"

"No. None of us. *Ever*."

Cruncher.

"You *lie*," he continued. "I see it. We all do."

I blinked. "Lie? No, I—"

"You don't *talk*. You *listen*. You don't care about Michelle. Don't care about anyone. You just want what we *know*. For your *reports*."

"That's not entirely true, Cruncher. I do care. I know Michelle must—"

"You don't know *shit*. Go away."

"I'm sorry I upset you." I rolled on my axis and braced against the mirror.

"You *can't* know Meesh," he growled as I pushed off. "You never *lost* anyone. You never *had* anyone."

"You leave her alone."

He was wrong on both counts. And at least Szpindel had died knowing that Michelle cared for him.

Chelsea died thinking I just didn't give a shit.

It had been two years or more, and while we still interfaced

occasionally we hadn't met in the flesh since the day she'd left. She came at me from right out of the Oort, sent an urgent voice message to my inlays: *Cygnus. Please call NOW. It's important.*

It was the first time since I'd known her that she'd ever blanked the optics.

I knew it was important. I knew it was bad, even without picture. I knew *because* there was no picture, and I could tell it was worse than bad from the harmonics in her voice. I could tell it was lethal.

I found out afterwards that she'd gotten caught in the crossfire. The Realists had sown a fibrodysplasia variant outside the Boston catacombs; an easy tweak, a single-point retroviral whose results served both as an act of terrorism and an ironic commentary on the frozen paralysis of Heaven's occupants. It rewrote a regulatory gene controlling ossification on Chromosome 4, and rigged a metabolic bypass at three loci on 17.

Chelsea started growing a new skeleton. Her joints were calcifying within fifteen hours of exposure, her ligaments and tendons within twenty. By then they were starving her at the cellular level, trying to slow the bug by depriving it of metabolites, but they could only buy time and not much of it. Twenty-three hours in, her striated muscles were turning to stone.

I didn't find this out immediately, because I didn't call her back. I didn't need to know the details. I could tell from her voice that she was dying. Obviously she wanted to say goodbye.

I couldn't talk to her until I knew how to do that.

I spent hours scouring the noosphere, looking for precedents. There's no shortage of ways to die; I found millions of case records dealing with the etiquette. Last words, last vows, instruction manuals for the soon-to-bereaved. Palliative neuropharm. Extended and expository death scenes in popular fiction. I went through it all, assigned a dozen front-line filters to separate heat from light.

By the time she called again the news was out: acute Golem outbreak lancing like a white-hot needle through the heart of

Boston. Containment measures holding. Heaven secure. Modest casualties expected. Names of victims withheld pending notification of kin.

I still didn't know the principles, the *rules*: all I had were examples. Last wills and testaments; the negotiation of jumpers with their would-be rescuers; diaries recovered from imploded submarines or lunar crash sites. Recorded memoirs and deathbed confessions rattling into flatline. Black box transcripts of doomed spaceships and falling beanstalks, ending in fire and static. All of it relevant. None of it useful; none of it *her*.

She called again, and still the optics were blank, and still I didn't answer.

But the last time she called, she didn't spare me the view.

They'd made her as comfortable as possible. The gelpad conformed to every twisted limb, every erupting spur of bone. They would not have left her in any pain.

Her neck had torqued down and to the side as it petrified, left her staring at the twisted claw that had once been her right hand. Her knuckles were the size of walnuts. Plates and ribbons of ectopic bone distended the skin of her arms and shoulders, buried her ribs in a fibrous mat of calcified flesh.

Movement was its own worst enemy. Golem punished even the slightest twitch, provoked the growth of fresh bone along any joints and surfaces conspiring to motion. Each hinge and socket had its own nonrenewable ration of flexibility, carved in stone; every movement depleted the account. The body seized incrementally. By the time she let me look at her, Chelsea had almost exhausted her degrees of freedom.

"Cyg," she slurred. "Know you're there."

Her jaw was locked half-open; her tongue must have stiffened with every word. She did not look at the camera. She could not look at the camera.

"Guess I know why you're not answ'ring. I'll try'nt—*try not* to take it pers'n'ly."

Ten thousand deathbed goodbyes arrayed around me, a million more within reach. What was I supposed to do, pick one at random? Stitch them into some kind of composite? All these

words had been for other people. Grafting them onto Chelsea would reduce them to clichés, to trite platitudes. To insults.

"Want t'say, don' feel bad. I know y're just— 's'not your fault, I guess. You'd pick up if you could."

And say what? What do you say to someone who's dying in fast-forward before your eyes?

"Just keep trying t'connect, y'know. Can't help m'self..."

Although the essentials of this farewell are accurate, details from several deaths have been combined for dramatic purposes.

"Please? Jus'—talk to me, Cyg..."

More than anything, I wanted to.

"Siri, I...just..."

I'd spent all this time trying to figure out *how*.

"Forget't," she said, and disconnected.

I whispered something into the dead air. I don't even remember what.

I really wanted to talk to her.

I just couldn't find an algorithm that fit.

YE SHALL KNOW THE TRUTH, AND THE TRUTH SHALL
MAKE YOU MAD.

—ALDOUS HUXLEY

THEY'D HOPED, BY now, to have banished sleep forever.

The waste was nothing short of obscene: a third of every Human life spent with its strings cut, insensate, the body burning fuel but not *producing*. Think of all we could accomplish if we didn't have to lapse into unconsciousness every fifteen hours or so, if our minds could stay awake and alert from the moment of infancy to that final curtain call a hundred twenty years later. Think of eight billion souls with no off switch and no down time until the very chassis wore out.

Why, we could go to the stars.

It hadn't worked out that way. Even if we'd outgrown the need to stay quiet and hidden during the dark hours—the only predators left were those we'd brought back ourselves—the brain still needed time apart from the world outside. Experiences had to be catalogued and filed, mid-term memories promoted to long-term ones, free radicals swept from their hiding places among the dendrites. We had only reduced the need for sleep, not eliminated it—and that incompressible residue of downtime seemed barely able to contain the dreams and phantoms left behind. They squirmed in my head like creatures in a draining tidal pool.

I woke.

I was alone, weightless, in the center of my tent. I could have sworn something had tapped me on the back. Leftover hallucination, I thought. A lingering aftereffect of the haunted mansion, going for one last bit of gooseflesh en route to extinction.

But it happened again. I bumped against the keelward curve of the bubble, bumped again, head and shoulder-blades against fabric; the rest of me came after, moving gently but irresistibly

Down.

Theseus was accelerating.

No. Wrong direction. *Theseus* was *rolling*, like a harpooned whale at the surface of the sea. Turning her belly to the stars.

I brought up ConSensus and threw a Nav-tac summary against the wall. A luminous point erupted from the outline of our ship, crawled away from Big Ben leaving a bright filament etched in its wake. I watched until the numbers read 15G.

"Siri. My quarters, please."

I jumped. It sounded as though the vampire had been at my very shoulder.

"Coming."

An ampsat relay, climbing at long last to an intercept with the Icarus antimatter stream. Somewhere behind the call of duty, my heart sank.

We weren't running, Robert Cunningham's fondest wishes

notwithstanding. *Theseus* was stockpiling ordnance.

The open hatch gaped like a cave in the face of a cliff. The pale blue light from the spine couldn't seem to reach inside. Sarasti was barely more than a silhouette, black on gray, his bright bloody eyes reflecting catlike in the surrounding gloom.

"Come." He amped up the shorter wavelengths in deference to human vision. The interior of the bubble brightened, although the light remained slightly red-shifted. Like *Rorschach* with high beams.

I floated into Sarasti's parlor. His face, normally paper-white, was so flushed it looked sunburned. *He gorged himself*, I couldn't help thinking. *He drank deep*. But all that blood was his own. Usually he kept it deep in the flesh, favoring the vital organs. Vampires were efficient that way. They only washed out their peripheral tissues occasionally, when lactate levels got too high.

Or when they were hunting.

He had a needle to his throat, injected himself with three cc's of clear liquid as I watched. His antiEuclidean. I wondered how often he had to replenish them, now that he'd lost faith in the implants. He withdrew the needle and slipped it into a sheath gecked to a convenient strut. His color drained as I watched, sinking back to the core, leaving his skin waxy and corpse-like.

"You're here as official observer," Sarasti said.

I observed. His quarters were even more spartan than mine. No personal effects to speak of. No custom coffin lined with shrink-wrapped soil. Nothing but two jumpsuits, a pouch for toiletries, and a disconnected fiberop umbilicus half as thick as my little finger, floating like a roundworm in formalin. Sarasti's hardline to the Captain. Not even a cortical jack, I remembered. It plugged into the medulla, the brainstem. That was logical enough; that was where all the neural cabling converged, the point of greatest bandwidth. Still, it was a disquieting thought

—that Sarasti linked to the ship through the brain of a reptile.

An image flared on the wall, subtly distorted against the concave surface: Stretch and Clench in their adjoining cells, rendered in splitscreen. Cryptic vitals defaced little grids below each image.

The distortion distracted me. I looked for a corrected feed in ConSensus, came up empty. Sarasti read my expression: "Closed circuit."

By now the scramblers would have seemed sick and ragged even to a virgin audience. They floated near the middle of their respective compartments, segmented arms drifting aimlessly back and forth. Membranous patches of—skin, I suppose—were peeling from the cuticles, giving them a fuzzy, decomposing aspect.

"The arms move continuously," Sarasti remarked. "Robert says it assists in circulation."

I nodded, watching the display.

"Creatures that move between stars can't even perform basic metabolic functions without constant flailing." He shook his head. "Inefficient. Primitive."

I glanced at the vampire. He remained fixed on our captives.

"*Obscene*," he said, and moved his fingers.

A new window opened on the wall: the Rosetta protocol, initializing. Kilometers away, microwaves flooded the holding tanks.

I reminded myself: *No interference. Only observation.*

However weakened their condition, the scramblers were not yet indifferent to pain. They knew the game, they knew the rules; they dragged themselves to their respective panels and played for mercy. Sarasti had simply invoked a step-by-step replay of some previous sequence. The scramblers went through it all again, buying a few moments' intermittent respite with the same old proofs and theorems.

Sarasti clicked, then spoke: "They regenerate these solutions faster than they did before. Do you think they're acclimated to the microwaves?"

Another readout appeared on the display; an audio alarm

began chirping somewhere nearby. I looked at Sarasti, and back at the readout: a solid circle of turquoise backlit by a pulsing red halo. The shape meant *atmospheric anomaly*. The color meant *oxygen*.

I felt a moment of confusion—(*Oxygen? Why would oxygen set off the alarm?*)—until I remembered: Scramblers were *anaerobes*.

Sarasti muted the alarm with a wave of his hand.

I cleared my throat: "You're *poisoning*—"

"Watch. Performance is consistent. No change."

I swallowed. *Just observe*.

"Is this an execution?" I asked. "Is this a, a mercy killing?"

Sarasti looked past me, and smiled. "No."

I dropped my eyes. "What, then?"

He pointed at the display. I turned, reflexively obedient.

Something stabbed my hand like a spike at a crucifixion.

I screamed. Electric pain jolted to my shoulder. I yanked my hand back without thinking; the embedded blade split its flesh like a fin through water. Blood sprayed into the air and stayed there, a comet's tail of droplets tracing the frenzied arc of my hand.

Sudden scalding heat from behind. Flesh charred on my back. I screamed again, flailing. A veil of bloody droplets swirled in the air.

Somehow I was in the corridor, staring dumbly at my right hand. It had been split to the heel of the palm, flopped at the end of my wrist in two bloody, bifingered chunks. Blood welled from the torn edges and wouldn't fall. Sarasti advanced through a haze of trauma and confusion. His face swam in and out of focus, rich with his blood or mine. His eyes were bright red mirrors, his eyes were time machines. Darkness roared around them and it was half a million years ago and I was just another piece of meat on the African savannah, a split-second from having its throat torn out.

"Do you see the problem?" Sarasti asked, advancing. A great spider crab hovered at his shoulder. I forced focus through the pain: one of Bates' grunts, taking aim. I kicked blindly, hit the

ladder through sheer happenstance, careened backwards down the corridor.

The vampire came after me, his face split into something that would have been a smile on anyone else. "Conscious of pain, you're *distracted* by pain. You're *fixated* on it. Obsessed by the one threat, you miss the other."

I flailed. Crimson mist stung my eyes.

"So much more *aware*, so much less *perceptive*. An automaton could do better."

He's snapped, I thought. *He's insane*. And then *No, he's a transient. He's always been a transient—*

"*They* could do better," he said softly.

—and he's been hiding for days. Deep down. Hiding from the seals.

What else would he do?

Sarasti raised his hands, fading in and out of focus. I hit something, kicked without aiming, bounced away through swirling mist and startled voices. Metal cracked the back of my head and spun me around.

A hole, a burrow. A place to hide. I dove through, my torn hand flapping like a dead fish against the edge of the hatch. I cried out and tumbled into the drum, the monster at my heels.

Startled shouts, very close now. "This wasn't the plan, Jukka! *This wasn't the goddamned plan!*" That was Susan James, full of outrage, while Amanda Bates snarled "*Stand down, right fucking now!*" and leapt from the deck to do battle. She rose through the air, all overclocked reflexes and carboplatinum augments but Sarasti just batted her aside and kept on coming. His arm shot out like a striking snake. His hand clamped around my throat.

"Is this what you meant?" James cried from some dark irrelevant hiding place. "Is this your *preconditioning*?"

Sarasti *shook* me. "Are you *in* there, Keeton?"

My blood splattered across his face like rain. I babbled and cried.

"Are you *listening*? Can you *see*?"

And suddenly I could. Suddenly everything clicked into focus. Sarasti wasn't talking at all. Sarasti didn't even exist anymore.

Nobody did. I was alone in a great spinning wheel surrounded by things that were made out of meat, things that moved *all by themselves*. Some of them were wrapped in pieces of cloth. Strange nonsensical sounds came from holes at their top ends, and there were *other* things up there, bumps and ridges and something like marbles or black buttons, wet and shiny and embedded in the slabs of meat. They glistened and jiggled and moved as if trying to escape.

I didn't understand the sounds the meat was making, but I heard a voice from somewhere. It was like God talking, and that I couldn't *help* but understand.

"Get out of your *room*, Keeton," it hissed. "Stop *transposing* or *interpolating* or *rotating* or whatever it is you do. Just *listen*. For once in your goddamned life, *understand* something. Understand that your life depends on it. Are you *listening*, Keeton?"

And I cannot tell you what it said. I can only tell you what I heard.

You invest so much in it, don't you? It's what elevates you above the beasts of the field, it's what makes you *special*. Homo *sapiens*, you call yourself. Wise Man. Do you even know what it is, this *consciousness* you cite in your own exaltation? Do you even know what it's *for*?

Maybe you think it gives you free will. Maybe you've forgotten that sleepwalkers converse, drive vehicles, commit crimes and clean up afterwards, unconscious the whole time. Maybe nobody's told you that even *waking* souls are only slaves in denial.

Make a conscious choice. *Decide* to move your index finger. Too late! The electricity's already halfway down your arm. Your body began to act a full half-second before your conscious self 'chose' to, for the self chose nothing; something *else* set your body in motion, sent an executive summary—almost an

afterthought— to the homunculus behind your eyes. That little man, that arrogant subroutine that thinks of itself as *the* person, mistakes correlation for causality: it reads the summary and it sees the hand move, and it thinks that one drove the other.

But it's not in charge. *You're* not in charge. If free will even exists, it doesn't share living space with the likes of you.

Insight, then. Wisdom. The quest for knowledge, the derivation of theorems, science and technology and all those exclusively *human* pursuits that must surely rest on a conscious foundation. Maybe *that's* what sentience would be for— if scientific breakthroughs didn't spring fully-formed from the *subconscious* mind, manifest themselves in dreams, as full-blown insights after a deep night's sleep. It's the most basic rule of the stymied researcher: *stop thinking about the problem*. Do something else. It will come to you if you just stop being *conscious* of it.

Every concert pianist knows that the surest way to ruin a performance is to be aware of what the fingers are doing. Every dancer and acrobat knows enough to let the mind go, let the body run itself. Every driver of any manual vehicle arrives at destinations with no recollection of the stops and turns and roads traveled in getting there. You are all sleepwalkers, whether climbing creative peaks or slogging through some mundane routine for the thousandth time. You are all sleepwalkers.

Don't even *try* to talk about the learning curve. Don't bother citing the months of deliberate practice that precede the unconscious performance, or the years of study and experiment leading up to the gift-wrapped Eureka moment. So what if *your* lessons are all learned consciously? Do you think that proves there's no other way? Heuristic software's been learning from experience for over a hundred years. Machines master chess, cars learn to drive themselves, statistical programs face problems and design the experiments to solve them and you think that the only path to learning leads through *sentience*? You're Stone-age nomads, eking out some marginal existence on the veldt—denying even the possibility of agriculture, because

hunting and gathering was good enough for your parents.

Do you want to know what consciousness is for? Do you want to know the only *real* purpose it serves? Training wheels. You can't see both aspects of the Necker Cube at once, so it lets you focus on one and dismiss the other. That's a pretty half-assed way to parse reality. You're always better off looking at more than one side of *anything*. Go on, try. Defocus. It's the next logical step.

Oh, but you can't. There's something in the way.

And it's fighting back.

Evolution has no foresight. Complex machinery develops its own agendas. Brains—cheat. Feedback loops evolve to promote stable heartbeats and then stumble upon the temptation of rhythm and music. The rush evoked by fractal imagery, the algorithms used for habitat selection, metastasize into art. Thrills that once had to be *earned* in increments of fitness can now be had from pointless introspection. Aesthetics rise unbidden from a trillion dopamine receptors, and the system moves beyond modeling the organism. It begins to model the very *process* of modeling. It consumes ever-more computational resources, bogs itself down with endless recursion and irrelevant simulations. Like the parasitic DNA that accretes in every natural genome, it persists and proliferates and produces nothing but itself. Metaprocesses bloom like cancer, and awaken, and call themselves *I*.

The system weakens, slows. It takes so much longer now to *perceive*—to assess the input, mull it over, *decide* in the manner of cognitive beings. But when the flash flood crosses your path, when the lion leaps at you from the grasses, advanced self-awareness is an unaffordable indulgence. The brain stem does

its best. It sees the danger, hijacks the body, reacts a hundred times faster than that fat old man sitting in the CEO's office upstairs; but every generation it gets harder to work around this—this creaking neurological bureaucracy.

I wastes energy and processing power, self-obsesses to the point of psychosis. Scramblers have no need of it, scramblers are more parsimonious. With simpler biochemistries, with smaller brains—deprived of tools, of their ship, even of parts of their own metabolism—they think rings around you. They hide their language in plain sight, even when you know what they're saying. They turn your own cognition against itself. *They travel between the stars*. This is what intelligence can do, unhampered by self-awareness.

I is not the working mind, you see. For Amanda Bates to say "I do not exist" would be nonsense; but when the processes beneath say the same thing, they are merely reporting that the parasites have died. They are only saying that they are free.

IF THE HUMAN BRAIN WERE SO SIMPLE THAT WE COULD
UNDERSTAND IT, WE WOULD BE SO SIMPLE THAT WE
COULDN'T.

—EMERSON M. PUGH

SARASTI, YOU BLOODSUCKER.

My knees pressed against my forehead. I hugged my folded legs as though clinging to a branch over a chasm.

You vicious asshole. You foul sadistic monster.

My breath rasped loud and mechanical. It nearly drowned out the blood roaring in my ears.

You tore me apart, you made me piss and shit myself and I cried like some gutted baby and you stripped me naked, you fucking thing, you night crawler, you broke my tools, you took away anything I ever had that let me touch anyone and you didn't have

to you *babyfucker*, it wasn't necessary but you knew that didn't you? You just wanted to play. I've seen your kind at it before, cats toying with mice, catch and release, a taste of freedom and then pouncing again, biting, not hard enough to kill— not just yet— before you let them loose again and they're hobbling now, maybe a leg snapped or a gash in the belly but they're still trying, still running or crawling or dragging themselves as fast as they can until you're on them again, and again because it's fun, because it gives you pleasure you sadistic piece of shit. You send us into the arms of that hellish thing and it plays with us too, and maybe you're even working together because it let me escape just like you do, it let me run right back into your arms and then you strip me down to some raw half-brained defenseless animal, I can't rotate or transform I can't even talk and you—

You—

It wasn't even personal, was it? You don't even hate me. You were just sick of keeping it all in, sick of restraining yourself with all this meat, and nobody else could be spared from their jobs. This was my job, wasn't it? Not synthesist, not conduit. Not even cannon fodder or decoy duty. I'm just something disposable to sharpen your claws on.

I hurt so much. It hurt just to breathe.

I was so alone.

Webbing pressed against the curve of my back, bounced me forward gently as a breeze, caught me again. I was back in my tent. My right hand itched. I tried to flex the fingers, but they were embedded in amber. Left hand reached for right, and found a plastic carapace extending to the elbow.

I opened my eyes. Darkness. Meaningless numbers and a red LED twinkled from somewhere along my forearm.

I didn't remember coming here. I didn't remember anyone fixing me.

Breaking. Being broken. That's what I remembered. I wanted to die. I wanted to just stay curled up until I withered away.

After an age, I forced myself to uncoil. I steadied myself, let some miniscule inertia bump me against the taut insulated fabric of my tent. I waited for my breathing to steady. It seemed

to take hours.

I called ConSensus to the wall, and a feed from the drum. Soft voices, harsh light flaring against the wall: hurting my eyes, peeling them raw. I killed visual, and listened to words in the darkness.

"—a phase?" someone asked.

Susan James, her personhood restored. I knew her again: not a meat sack, no longer a *thing*.

"We *have* been over this." That was Cunningham. I knew him too. I knew them all. Whatever Sarasti had done to me, however far he'd yanked me from my room, I'd somehow fallen back inside.

It should have mattered more.

"—because for one thing, if it were really so pernicious, natural selection would have weeded it out," James was saying.

"You have a naïve understanding of evolutionary processes. There's no such thing as *survival of the fittest*. *Survival of the most adequate*, maybe. It doesn't matter whether a solution's optimal. All that matters is whether it beats the alternatives."

I knew that voice too. It belonged to a demon.

"Well, we damn well *beat the alternatives*." Some subtle overdubbed harmonic in James' voice suggested a chorus: the whole Gang, rising as one in opposition.

I couldn't believe it. I'd just been mutilated, beaten before their eyes—and they were talking about *biology*?

Maybe she's afraid to talk about anything else, I thought. *Maybe she's afraid she might be next*.

Or maybe she just couldn't care less what happens to me.

"It's true," Sarasti told her, "that your intellect makes up for your self-awareness to some extent. But you're flightless birds on a remote island. You're not so much successful as *isolated* from any real competition."

No more clipped speech patterns. No more terse phrasing. The transient had made his kill, found his release. Now he didn't care *who* knew he was around.

"You?" Michelle whispered. "Not *we*?"

"We stop racing long ago," the demon said at last. "It's not our

fault you don't leave it at that."

"Ah." Cunningham again. "Welcome back. Did you look in on Ke—"

"No." Bates said.

"Satisfied?" the demon asked.

"If you mean the grunts, I'm satisfied you're out of them," Bates said. "If you mean— it was completely unwarranted, Jukka."

"It isn't."

"You assaulted a crewmember. If we had a brig you'd be in it for the rest of the trip."

"This isn't a military vessel, Major. You're not in charge."

I didn't need a visual feed to know what Bates thought of that. But there was something else in her silence, something that made me bring the drum camera back online. I squinted against the corrosive light, brought down the brightness until all that remained was a faint whisper of pastels.

Yes. Bates. Stepping off the stairway onto the deck

"Grab a chair," Cunningham said from his seat in the Commons. "It's golden oldies time."

There was something about her.

"I'm sick of that song," Bates said. "We've played it to death."

Even now, my tools chipped and battered, my perceptions barely more than baseline, I could see the change. This torture of prisoners, this assault upon crew, had crossed a line in her head. The others wouldn't see it. The lid on her affect was tight as a boilerplate. But even through the dim shadows of my window the topology glowed around her like neon.

Amanda Bates was no longer merely *considering* a change of command. Now it was only a matter of when.

The universe was closed and concentric.

My tiny refuge lay in its center. Outside that shell was another, ruled by a monster, patrolled by his lackeys. Beyond

that was another still, containing something even more monstrous and incomprehensible, something that might soon devour us all.

There was nothing else. Earth was a vague hypothesis, irrelevant to this pocket cosmos. I saw no place into which it might fit.

I stayed in the center of the universe for a long time, hiding. I kept the lights off. I didn't eat. I crept from my tent only to piss or shit in the cramped head down at Fab, and only when the spine was deserted. A field of painful blisters rose across my flash-burned back, as densely packed as kernels on a corncob. The slightest abrasion tore them open.

Nobody tapped at my door, nobody called my name through ConSensus. I wouldn't have answered if they had. Maybe they knew that, somehow. Maybe they kept their distance out of respect for my privacy and my disgrace.

Maybe they just didn't give a shit.

I peeked outside now and then, kept an eye on Tactical. I saw *Scylla* and *Charybdis* climb into the accretion belt and return towing captured reaction mass in a great distended mesh between them. I watched our ampsat reach its destination in the middle of nowhere, saw antimatter's quantum blueprints stream down into *Theseus's* buffers. Mass and specs combined in Fab, topped up our reserves, forged the tools that Jukka Sarasti needed for his master plan, whatever that was.

Maybe he'd lose. Maybe *Rorschach* would kill us all, but not before it had played with Sarasti the way Sarasti had played with me. That would almost make it worthwhile. Or maybe Bates' mutiny would come first, and succeed. Maybe she would slay the monster, and commandeer the ship, and take us all to safety.

But then I remembered: the universe was closed, and so very small. There was really nowhere else to go.

I put my ear to feeds throughout the ship. I heard routine instructions from the predator, murmured conversations among the prey. I took in only sound, never sight; a video feed would have spilled light into my tent, left me naked and exposed. So I

listened in the darkness as the others spoke among themselves. It didn't happen often any more. Perhaps too much had been said already, perhaps there was nothing left to do but mind the countdown. Sometimes hours would pass with no more than a cough or a grunt.

When they did speak, they never mentioned my name. Only once did I hear any of them even hint at my existence.

That was Cunningham, talking to Sascha about zombies. I heard them in the galley over breakfast, unusually talkative. Sascha hadn't been let out for a while, and was making up for lost time. Cunningham let her, for reasons of his own. Maybe his fears had been soothed somehow, maybe Sarasti had revealed his master plan. Or maybe Cunningham simply craved distraction from the imminence of the enemy.

"It doesn't *bug* you?" Sascha was saying. "Thinking that your mind, the very thing that makes you *you*, is nothing but some kind of parasite?"

"Forget about *minds*," he told her. "Say you've got a device designed to monitor—oh, cosmic rays, say. What happens when you turn its sensor around so it's not pointing at the sky anymore, but at its own guts?" He answered himself before she could: "It does what it's built to. It measures cosmic rays, even though it's not looking at them any more. It parses its own circuitry in terms of cosmic-ray metaphors, because those *feel* right, because they feel natural, because it can't look at things any other way. But it's the *wrong metaphor*. So the system misunderstands everything about itself. Maybe that's not a grand and glorious evolutionary leap after all. Maybe it's just a design flaw."

"But *you're* the biologist. You know Mom was right better'n anyone. Brain's a big glucose hog. Everything it does costs through the nose."

"True enough," Cunningham admitted.

"So sentience has gotta be *good* for something, then. Because it's *expensive*, and if it sucks up energy without doing anything useful then evolution's gonna weed it out just like *that*."

"Maybe it did." He paused long enough to chew food or suck

smoke. "Chimpanzees are smarter than Orangutans, did you know that? Higher encephalisation quotient. Yet they can't always recognize themselves in a mirror. Orangs can."

"So what's your point? Smarter animal, less self-awareness? Chimpanzees are becoming nonsentient?"

"Or they were, before we stopped everything in its tracks."

"So why didn't that happen to us?"

"What makes you think it didn't?"

It was such an obviously stupid question that Sascha didn't have an answer for it. I could imagine her gaping in the silence.

"You're not thinking this through," Cunningham said. "We're not talking about some kind of zombie lurching around with its arms stretched out, spouting mathematical theorems. A smart automaton would *blend in*. It would observe those around it, mimic their behavior, act just like everyone else. All the while completely unaware of what it was doing. Unaware even of its own existence."

"Why would it bother? What would motivate it?"

"As long as you pull your hand away from an open flame, who cares whether you do it because it *hurts* or because some feedback algorithm says *withdraw if heat flux exceeds critical T*? Natural selection doesn't care about *motives*. If impersonating something increases fitness, then nature will select good impersonators over bad ones. Keep it up long enough and no conscious being would be able to pick your zombie out of a crowd." Another silence; I could hear him chewing through it. "It'll even be able to participate in a conversation like this one. It could write letters home, impersonate real human feelings, without having the slightest awareness of its own existence."

"I dunno, Rob. It just seems—"

"Oh, it might not be perfect. It might be a bit redundant, or resort to the occasional expository infodump. But even *real* people do that, don't they?"

"And eventually, there aren't any real people left. Just robots pretending to give a shit."

"Perhaps. Depends on the population dynamics, among other things. But I'd guess that at least one thing an automaton lacks

is empathy; if you can't feel, you can't really relate to something that does, even if you *act* as though you do. Which makes it interesting to note how many sociopaths show up in the world's upper echelons, hmm? How ruthlessness and bottom-line self-interest are so lauded up in the stratosphere, while anyone showing those traits at ground level gets carted off into detention with the Realists. Almost as if society itself is being reshaped from the inside out."

"Oh, come on. Society was *always* pretty— wait, you're saying the world's corporate elite are *nonsentient*?"

"God, no. Not nearly. Maybe they're just starting down that road. Like chimpanzees."

"Yeah, but sociopaths don't blend in well."

"Maybe the ones that get diagnosed don't, but by definition they're the bottom of the class. The others are too smart to get caught, and *real* automatons would do even better. Besides, when you get powerful enough, you don't need to act like other people. Other people start acting like you."

Sascha whistled. "Wow. Perfect play-actor."

"Or not so perfect. Sound like anyone we know?"

They may have been talking about someone else entirely, I suppose. But that was as close to a direct reference to Siri Keeton that I heard in all my hours on the grapevine. Nobody else mentioned me, even in passing. That was statistically unlikely, given what I'd just endured in front of them all; someone should have said *something*. Perhaps Sarasti had ordered them not to discuss it. I didn't know why. But it was obvious by now that the vampire had been orchestrating their interactions with me for some time. Now I was in hiding, but he knew I'd listen in at some point. Maybe, for some reason, he didn't want my surveillance—contaminated...

He could have simply locked me out of ConSensus. He hadn't. Which meant he still wanted me in the loop.

Zombies. Automatons. Fucking sentience.

For once in your goddamned life, understand something.

He'd said that to me. Or something had. During the assault.

Understand that your life depends on it.

Almost as if he were doing me a *favor*.

Then he'd left me alone. And had evidently told the others to do the same.

Are you listening, Keeton?

And he hadn't locked me out of ConSensus.

Centuries of navel-gazing. Millennia of masturbation. Plato to Descartes to Dawkins to Rhanda. Souls and zombie agents and qualia. Kolmogorov complexity. Consciousness as Divine Spark. Consciousness as electromagnetic field. Consciousness as functional cluster.

I explored it all.

Wegner thought it was an executive summary. Penrose heard it in the singing of caged electrons. Nirretranders said it was a fraud; Kazim called it leakage from a parallel universe. Metzinger wouldn't even admit it existed. The AIs claimed to have worked it out, then announced they couldn't explain it to us. Gödel was right after all: no system can fully understand itself.

Not even the synthesists had been able to rotate it down. The load-bearing beams just couldn't take the strain.

All of them, I began to realize, had missed the point. All those theories, all those drugdreams and experiments and models trying to prove what consciousness *was*: none to explain what it was *good* for. None needed: obviously, consciousness makes us what we are. It lets us see the beauty and the ugliness. It elevates us into the exalted realm of the spiritual. Oh, a few outsiders—Dawkins, Keogh, the occasional writer of hackwork fiction who barely achieved obscurity—wondered briefly at the why of it: why *not* soft computers, and no more? Why should nonsentient systems be inherently inferior? But they never really raised their voices above the crowd. The value of what we are was too trivially self-evident to ever call into serious question.

Yet the questions persisted, in the minds of the laureates, in the angst of every horny fifteen-year-old on the planet. Am I nothing but sparking chemistry? Am I a magnet in the ether? I am more than my eyes, my ears, my tongue; I am the little thing *behind* those things, the thing looking out from inside. But who looks out from *its* eyes? What does it reduce to? Who am I? Who am I? *Who am I?*

What a stupid fucking question. I could have answered it in a second, if Sarasti hadn't forced me to understand it first.

NOT UNTIL WE ARE LOST DO WE BEGIN TO UNDERSTAND
OURSELVES.

—HENRY DAVID THOREAU

THE SHAME HAD scoured me and left me hollow. I didn't care who saw me. I didn't care what state they saw me in. For days I'd floated in my tent, curled into a ball and breathing my own stink while the others made whatever preparations my tormentor had laid out for them. Amanda Bates was the only one who'd raised even a token protest over what Sarasti had done to me. The others kept their eyes down and their mouths shut and did what he told them to— whether from fear or indifference I couldn't tell.

It was something else I'd stopped caring about.

Sometime during that span the cast on my arm cracked open like a shucked clam. I upped the lumens long enough to assess its handiwork; my repaired palm itched and glistened in twilight, a longer, deeper Fate line running from heel to web. Then back to darkness, and the blind unconvincing illusion of safety.

Sarasti wanted me to believe. Somehow he must have thought that brutalising and humiliating me would accomplish that—that broken and drained, I would become an empty vessel

to fill as he saw fit. Wasn't it a classic brainwashing technique—to shatter your victim and then glue the pieces back together in according to specs of your own choosing? Maybe he was expecting some kind of Stockholm Syndrome to set in, or maybe his actions followed some agenda incomprehensible to mere meat.

Maybe he'd simply gone insane.

He had broken me. He had presented his arguments. I had followed his trail of bread crumbs though ConSensus, through *Theseus*. And now, only nine days from graduation, I knew one thing for sure: Sarasti was wrong. He had to be. I couldn't see *how*, but I knew it just the same. He was wrong.

Somehow, absurdly, that had become the one thing I *did* care about.

No one in the spine. Only Cunningham visible in BioMed, poring over digital dissections, pretending to kill time. I floated above him, my rebuilt hand clinging to the top of the nearest stairwell; it dragged me in a slow, small circle as the Drum turned. Even from up there I could see the tension in the set of his shoulders: a system stuck in a holding pattern, corroding through the long hours as fate advanced with all the time in the world.

He looked up. "Ah. It lives."

I fought the urge to retreat. *Just a conversation, for God's sake. It's just two people talking. People do it all the time without your tools. You can do this. You can do this.*

Just try.

So I forced one foot after another down the stairs, weight and apprehension rising in lockstep. I tried to read Cunningham's topology through the haze. Maybe I saw a facade, only microns deep. Maybe he would welcome almost any distraction, even if he wouldn't admit it.

Or maybe I was just imagining it.

"How are you doing?" he asked as I reached the deck.

I shrugged.

"Hand all better, I see."

"No thanks to you."

I'd tried to stop that from coming out. Really.

Cunningham struck a cigarette. "Actually, I *was* the one who fixed you up."

"You also sat there and watched while he took me apart."

"I wasn't even there." And then, after a moment: "But you may be right. I might very well have sat it out in any event. Amanda and the Gang *did* try to intervene on your behalf, from what I hear. Didn't do a lot of good for anyone."

"So you wouldn't even try."

"Would you, if the situation were reversed? Go up unarmed against a vampire?"

I said nothing. Cunningham regarded me for a long moment, dragging on his cigarette. "He really got to you, didn't he?" he said at last.

"You're wrong," I said.

"Am I."

"I don't *play people*."

"Mmmm." He seemed to consider the proposition. "What word would you prefer, then?"

"I *observe*."

"That you do. Some might even call it *surveillance*."

"I—I read body language." Hoping that that was all he was talking about.

"It's a matter of degree and you know it. Even in a crowd there's a certain expectation of privacy. People aren't prepared to have their minds read off every twitch of the eyeball." He stabbed at the air with his cigarette. "And you. You're a shapeshifter. You present a different face to every one of us, and I'll wager none of them is real. The *real* you, if it even exists, is invisible..."

Something knotted below my diaphragm. "Who isn't? Who doesn't—try to fit in, who doesn't want to get along? There's nothing *malicious* about that. I'm a synthesist, for God's sake! I

never manipulate the variables."

"Well you see, that's the problem. It's not just *variables* you're manipulating."

Smoke writhed between us.

"But I guess you can't really understand that, can you." He stood and waved a hand. ConSensus windows imploded at his side. "Not your fault, really. You can't blame someone for the way they're wired."

"Give me a fucking break," I snarled.

His dead face showed nothing.

That, too, had slipped out before I could stop it—and after that came the flood: "You put so much *fucking* stock in that. You and your *empathy*. And maybe I *am* just some kind of imposter but most people would swear I'd worn their very souls. I don't *need* that shit, you don't have to *feel* motives to deduce them, it's better if you *can't*, it keeps you—"

"Dispassionate?" Cunningham smiled faintly.

"Maybe your *empathy's* just a comforting lie, you ever think of that? Maybe you *think* you know how the other person feels but you're only feeling *yourself*, maybe you're even worse than me. Or maybe we're all just guessing. Maybe the only difference is that I don't lie to myself about it."

"Do they look the way you imagined?" he asked.

"What? What are you talking about?"

"The scramblers. *Multijointed arms from a central mass*. Sounds rather similar to me."

He'd been into Szpindel's archives.

"I—Not really," I said. "The arms are more—flexible, in real life. More segmented. And I never really got a look at the body. What does that have to do with—"

"Close, though, wasn't it? Same size, same general body plan."

"So *what*?"

"Why didn't you report it?"

"I did. Isaac said it was just TMS. From *Rorschach*."

"You saw them before *Rorschach*. Or at least," he continued, "you saw *something* that scared you into blowing your cover, back when you were spying on Isaac and Michelle."

My rage dissipated like air through a breach. "They—they knew?"

"Only Isaac, I think. And it kept it between it and the logs. I suspect it didn't want to interfere with your *noninterference* protocols—although I'll wager that was the last time you ever caught the two of them in private, yes?"

I didn't say anything.

"Did you think the official observer was somehow exempt from observation?" Cunningham asked after a while.

"No," I said softly. "I suppose not."

He nodded. "Have you seen any since? I'm not talking about run-of-the-mill TMS hallucinations. I mean scramblers. Have you hallucinated any since you actually saw one in the flesh, since you *knew* what they looked like?"

I thought about it. "No."

He shook his head, some new opinion confirmed. "You really are something, Keeton, you know that? You don't lie to yourself? Even now, you don't know what you know."

"What are you talking about?"

"You *figured it out*. From *Rorschach's* architecture, probably—form follows function, yes? Somehow you pieced together a fairly good idea of what a scrambler looked like before anyone ever laid eyes on them. Or at least—" He drew a breath; his cigarette flared like an LED—"part of you did. Some collection of unconscious modules working their asses off on your behalf. But they can't show their work, can they? You don't have conscious access to those levels. So one part of the brain tries to tell another any way it can. Passes notes under the table."

"Blindsight," I murmured. *You just get a feeling of where to reach...*

"More like schizophrenia, except you saw pictures instead of hearing voices. You saw *pictures*. And you *still* didn't understand."

I blinked. "But how would I—I mean—"

"What did you think, that *Theseus* was haunted? That the scramblers were communing with you telepathically? What you do—it *matters*, Keeton. They told you you were nothing but

their stenographer and they hammered all those layers of hands-off passivity into you but you just had to take some initiative anyway, didn't you? Had to work the problem on your own. The only thing you couldn't do was admit it to yourself." Cunningham shook his head. "Siri Keeton. See what they've done to you."

He touched his face.

"See what they've done to us all," he whispered.

I found the Gang floating in the center of the darkened observation blister. She made room as I joined her, pushed to one side and anchored herself to a bit of webbing.

"Susan?" I asked. I honestly couldn't tell any more.

"I'll get her," Michelle said.

"No, that's all right. I'd like to speak to all of—"

But Michelle had already fled. The half-lit figure changed before me, and said, "She'd rather be alone right now."

I nodded. "You?"

James shrugged. "I don't mind talking. Although I'm surprised you're still doing your reports, after...."

"I'm—not, exactly. This isn't for Earth."

I looked around. Not much to see. Faraday mesh coated the inside of the dome like a gray film, dimming and graining the view beyond. Ben hung like a black malignancy across half the sky. I could make out a dozen dim contrails against vague bands of cloud, in reds so deep they bordered on black. The sun winked past James's shoulder, *our* sun, a bright dot that diffracted into faint splintered rainbows when I moved my head. That was pretty much it: starlight didn't penetrate the mesh, nor did the larger, dimmer particles of the accretion belt. The myriad dim pinpoints of shovel-nosed machinery were lost utterly.

Which might be a comfort to some, I supposed.

"Shitty view," I remarked. *Theseus* could have projected crisp

first-person vistas across the dome in an instant, more real than real.

"Michelle likes it," James said. "The way it feels. And Cruncher likes the diffraction effects, he likes— interference patterns."

We watched nothing for a while, by the dim half-light filtering out from the spine. It brushed the edges of James' profile.

"You set me up," I said at last.

She looked at me. "What do you mean?"

"You were talking around me all along, weren't you? All of you. You didn't bring me in until I'd been—" How had she put it? "*preconditioned*. The whole thing was planned to throw me off-balance. And then Sarasti— attacks me out of nowhere, and —"

"We didn't know about that. Not until the alarm went off."

"Alarm?"

"When he changed the gas mix. You must have heard it. Isn't that why you were there?"

"He called me to his tent. He told me to watch."

She regarded me from a face full of shadow. "You didn't try to stop him?"

I couldn't answer the accusation in her voice. "I just— observe," I said weakly.

"I thought you were trying to stop him from—" She shook her head. "*That's* why I thought he was attacking you."

"You're saying that wasn't an act? You weren't in on it?" I didn't believe it.

But I could tell she did.

"I thought you were trying to *protect* them." She snorted a soft, humorless laugh at her own mistake and looked away. "I guess I should have known better."

She should have. She should have known that taking orders is one thing; taking *sides* would have done nothing but compromise my integrity.

And I should have been used to it by now.

I forged on. "It was some kind of object lesson. A, a *tutorial*."

You can't torture the nonsentient or something, and — and I *heard* you, Susan. It wasn't news to you, it wasn't news to anyone except *me*, and..."

And you hid it from me. You all did. You and your whole gang and Amanda too. You've been hashing this out for days and you went out of your way to cover it up.

How did I miss it? How did I miss it?

"Jukka told us not to discuss it with you," Susan admitted.

"Why? This is exactly the kind of thing I'm *out* here for!"

"He said you'd—resist. Unless it was handled properly."

"Handled—Susan, he *assaulted* me! You *saw* what he—"

"We didn't know he was going to do that. None of us did."

"And he did it why? To win an argument?"

"That's what he says."

"Do you believe him?"

"Probably." After a moment she shrugged. "Who knows? He's a vampire. He's—opaque."

"But his record—I mean, he's, he's never resorted to overt violence before—"

She shook her head. "Why should he? He doesn't have to convince the *rest* of us of anything. We have to follow his orders regardless."

"So do I," I reminded her.

"He's not trying to convince *you*, Siri."

Ah.

I was only a conduit, after all. Sarasti hadn't been making his case to me at all; he'd been making it *through* me, and—

—and he was planning for a second round. Why go to such extremes to present a case to Earth, if Earth was irrelevant? Sarasti didn't expect the game to end out here. He expected Earth to *do* something in light of his—perspective.

"But what difference does it make?" I wondered aloud.

She just looked at me.

"Even if he's right, how does it change anything? How does *this*—" I raised my repaired hand—"change anything? Scramblers are intelligent, whether they're sentient or not. They're a potential threat either way. We still don't know. So

what difference does it make? Why did he *do* this to me? How does it *matter*?"

Susan raised her face to Big Ben and didn't answer.

Sascha returned her face to me, and tried to.

"It matters," she said, "because it means we attacked them before *Theseus* launched. Before Firefall, even."

"We attacked the—"

"You don't get it, do you? You don't." Sascha snorted softly. "If that isn't the fucking funniest thing I've heard in my whole short life."

She leaned forward, bright-eyed. "Imagine you're a scrambler, and you encounter a human signal for the very first time."

Her stare was almost predatory. I resisted the urge to back away.

"It should be so easy for you, Keeton. It should be the easiest gig you've ever had. Aren't you the user interface, aren't you the Chinese Room? Aren't you the one who never has to look inside, never has to walk a mile in anyone's shoes, because you figure everyone out from their *surfaces*?"

She stared at Ben's dark smoldering disk. "Well, there's your dream date. There's a whole race of nothing *but* surfaces. There's no *inside* to figure out. All the rules are right up front. So go to work, Siri Keeton. Make us proud."

There was no contempt in Sascha's voice, no disdain. There wasn't even anger, not in her voice, not in her eyes.

There was pleading. There were *tears*.

"Imagine you're a scrambler," she whispered again, as they floated like tiny perfect beads before her face.

Imagine you're a scrambler.

Imagine you have intellect but no insight, agendas but no *awareness*. Your circuitry hums with strategies for survival and persistence, flexible, intelligent, even technological—but no other circuitry monitors it. You can think of anything, yet are

conscious of nothing.

You can't imagine such a being, can you? The term *being* doesn't even seem to apply, in some fundamental way you can't quite put your finger on.

Try.

Imagine that you encounter a signal. It is structured, and dense with information. It meets all the criteria of an intelligent transmission. Evolution and experience offer a variety of paths to follow, branch-points in the flowcharts that handle such input. Sometimes these signals come from conspecifics who have useful information to share, whose lives you'll defend according to the rules of kin selection. Sometimes they come from competitors or predators or other inimical entities that must be avoided or destroyed; in those cases, the information may prove of significant tactical value. Some signals may even arise from entities which, while not kin, can still serve as allies or symbionts in mutually beneficial pursuits. You can derive appropriate responses for any of these eventualities, and many others.

You decode the signals, and stumble:

I had a great time. I really enjoyed him. Even if he cost twice as much as any other hooker in the dome—

To fully appreciate Kesey's Quartet—

They hate us for our freedom—

Pay attention, now—

Understand.

There are no meaningful translations for these terms. They are needlessly recursive. They contain no usable intelligence, yet they are structured intelligently; there is no chance they could have arisen by chance.

The only explanation is that something has coded nonsense in a way that poses as a useful message; only after wasting time and effort does the deception becomes apparent. The signal functions to consume the resources of a recipient for zero payoff and reduced fitness. The signal is a virus.

Viruses do not arise from kin, symbionts, or other allies.

The signal is an attack.

And it's coming from right about *there*.

"Now you get it," Sascha said.

I shook my head, trying to wrap it around that insane, impossible conclusion. "They're not even *hostile*." Not even capable of hostility. Just so profoundly alien that they couldn't help but treat human language itself as a form of combat.

How do you say *We come in peace* when the very words are an act of war?

"That's why they won't talk to us," I realized.

"Only if Jukka's right. He may not be." It was James again, still quietly resisting, still unwilling to concede a point that even her other selves had accepted. I could see why. Because if Sarasti was right, scramblers were the *norm*: evolution across the universe was nothing but the endless proliferation of automatic, organized complexity, a vast arid Turing machine full of self-replicating machinery forever unaware of its own existence. And we—we were the flukes and the fossils. We were the flightless birds lauding our own mastery over some remote island while serpents and carnivores washed up on our shores. Susan James could not bring herself to concede that point—because Susan James, her multiple lives built on the faith that communication resolves all conflict, would then be forced to admit the lie. If Sarasti was right, there was no hope of reconciliation.

A memory rose into my mind and stuck there: a man in motion, head bent, mouth twisted into an unrelenting grimace. His eyes focused on one foot, then the other. His legs moved stiffly, carefully. His arms moved not at all. He lurched like a zombie in thrall to rigor mortis.

I knew what it was. Proprioceptive polyneuropathy, a case study I'd encountered in ConSensus back before Szpindel had died. This was what Pag had once compared me to; a man who had lost his mind. Only self-awareness remained. Deprived of

the unconscious sense and subroutines he had always taken for granted, he'd had to focus on each and every step across the room. His body no longer knew where its limbs were or what they were doing. To move at all, to even remain upright, he had to bear constant witness.

There'd been no sound when I'd played that file. There was none now in its recollection. But I swore I could feel Sarasti at my shoulder, peering into my memories. I swore I heard him speak in my mind like a schizophrenic hallucination:

This is the best that consciousness can do, when left on its own.

"Right answer," I murmured. "Wrong question."

"What?"

"Stretch, remember? When you asked it which objects were in the window."

"And it missed the scrambler." James nodded. "So?"

"It didn't miss the scrambler. You thought you were asking about the things it *saw*, the things that *existed* on the board. Stretch thought you were asking about—"

"The things it was *aware* of," she finished.

"He's right," I whispered. "Oh God. I think he's right."

"Hey," James said. "Did you see *tha*—"

But I never saw what she was pointing at. *Theseus* slammed its eyelids shut and started howling.

Graduation came nine days early.

We didn't see the shot. Whatever gun port *Rorschach* had opened was precisely eclipsed on three fronts: the lab-hab hid it from *Theseus*, and two gnarled extrusions of the artefact itself hid it from each of the gun emplacements. A bolus of incendiary plasma shot from that blind spot like a thrown punch; it had split the inflatable wide open before the first alarm went up.

Alarms chased us aft. We launched ourselves down the spine through the bridge, through the crypt, past hatches and

crawlspace, fleeing the surface for any refuge with more than a hand's-breadth between skin and sky. Burrowing. ConSensus followed us back, its windows warping and sliding across struts and conduits and the concave tunnel of the spine itself. I paid no attention until we were back in the drum, deep in *Theseus'* belly. Where we could pretend we were safer.

Down on the turning deck Bates erupted from the head, tactical windows swirling like ballroom dancers around her. Our own window came to rest on the Commons bulkhead. The hab expanded across that display like a cheap optical illusion: both swelling and shrinking in our sights, that smooth surface billowing towards us while collapsing in on itself. It took me a moment to reconcile the contradiction: something had kicked the hab hard from its far side, sent it careening toward us in a slow, majestic tumble. Something had *opened* the hab, spilled its atmosphere and left its elastic skin drawing in on itself like a deflating balloon. The impact site swung into view as we watched, a scorched flaccid mouth trailing tenuous wisps of frozen spittle.

Our guns were firing. They shot nonconducting slugs that would not be turned aside by electromagnetic trickery—invisibly dark and distant to human eyes but I saw them through the tactical crosshairs of the firing robots, watched them sew twin dotted blackbodied arcs across the heavens. The streams converged as the guns tracked their targets, closed on two attenuate throwing stars fleeing spread-eagled through the void, their faces turned to *Rorschach* like flowers to the sun.

The guns cut them to pieces before they'd even made it half way.

But those shredded pieces kept falling, and suddenly the ground beneath was alive with motion. I zoomed the view: scramblers surged across *Rorschach's* hull like an orgy of snakes, naked to space. Some linked arms, one to another to another, built squirming vertebral daisy-chains anchored at one end. They lifted from the hull, waved through the radioactive vacuum like fronds of articulated kelp, reaching—grasping—

Neither Bates nor her machines were stupid. They targeted

the interlinked scramblers as ruthlessly as they'd gone after the escapees, and with a much higher total score. But there were simply too many targets, too many fragments snatched in passing. Twice I saw dismembered bits of Stretch and Clench caught by their brethren.

The ruptured hab loomed across ConSensus like a great torn leukocyte. Another alarm buzzed somewhere nearby: proximity alert. Cunningham shot into the drum from somewhere astern, bounced off a cluster of pipes and conduits, grabbed for support. "Holy *shit*—we are leaving, aren't we? Amanda?"

"No," Sarasti answered from everywhere.

"What—" *does it fucking* take? I caught myself. "Amanda, what if it fires on the ship?"

"It won't." She didn't take her eyes from her windows.

"How do you—"

"It can't. If it had spring-loaded any more firepower we'd have seen a change in thermal *and* microallometry." A false-color landscape rotated between us, its latitudes measured in time, its longitudes in delta-mass. Kilotons rose from that terrain like a range of red mountains. "Huh. Came in just under the noise lim—"

Sarasti cut her off. "Robert. Susan. EVA."

James blanched. "*What?*" Cunningham cried.

"Lab module's about to impact," the vampire said. "Salvage the samples. *Now.*" He killed the channel before anyone could argue.

But Cunningham wasn't about to argue. He'd just seen our death sentence commuted: why would Sarasti care about retrieving biopsy samples if he didn't think we stood a chance of escaping with them? The biologist steadied himself, braced towards the forward hatch. "I'm *there*," he said, shooting into the bow.

I had to admit it. Sarasti's psychology was getting better.

It wasn't working on James, though, or Michelle, or—I couldn't quite tell who was on top. "I can't go out there, Siri, it's—I *can't go out there...*"

Just observe. Don't interfere.

The ruptured inflatable collided impotently to starboard and flattened itself against the carapace. We felt nothing. Far away and far too near, the legions thinned across *Rorschach's* surface. They disappeared through mouths that puckered and dilated and magically closed again in the artefact's hull. The emplacements fired passionlessly at those who remained.

Observe.

The Gang of Four strobed at my side, scared to death.

Don't interfere.

"It's okay," I said. "I'll go."

The open airlock was like a dimple in the face of an endless cliff. I looked out from that indentation into the abyss.

This side of *Theseus* faced away from Big Ben, away from the enemy. The view was still unsettling enough: an endless panorama of distant stars, hard and cold and unwinking. A single, marginally brighter one, shining yellow, still so very far away. Any scant comfort I might have taken from that sight was lost when the sun went out for the briefest instant: a tumbling piece of rock, perhaps. Or one of *Rorschach's* shovelnosed entourage.

One step and I might never stop falling.

But I didn't step, and I didn't fall. I squeezed my pistol, jetted gently through the opening, turned. *Theseus'* carapace curved away from me in all directions. Towards the prow, the sealed observation blister rose above the horizon like a gunmetal sunrise. Further aft a tattered snowdrift peeked across the hull: the edge of the broken labhab.

And past it all, close enough to touch, the endless dark cloudscape of Big Ben: a great roiling wall extending to some flat distant horizon I could barely grasp even in theory. When I focused it was dark and endless shades of gray—but dim, sullen redness teased the corner of my eye when I looked away.

"Robert?" I brought Cunningham's suit feed to my HUD: a

craggy, motionless ice field thrown into high contrast by the light of his helmet. Interference from *Rorschach's* magnetosphere washed over the image in waves. "You there?"

Pops and crackles. The sound of breath and mumbling against an electrical hum. "Four point three. Four point oh. Three point eight—"

"Robert?"

"Three point—*shit*. What—what are you doing out here, Keeton? Where's the Gang?"

"I came instead." Another squeeze of the trigger and I was coasting towards the snowscape. *Theseus'* convex hull rolled past, just within reach. "To give you a hand."

"Let's move it then, shall we?" He was passing through a crevice, a scorched and jagged tear in the fabric that folded back at his touch. Struts, broken panels, dead robot arms tangled through the interior of the ice cave like glacial debris; their outlines writhed with static, their shadows leaped and stretched like living things in the sweep of his headlight. "I'm almost—"

Something that wasn't static moved in his headlight. Something *uncoiled*, just at the edge of the camera's view.

The feed died.

Suddenly Bates and Sarasti were shouting in my helmet. I tried to brake. My stupid useless legs kicked against vacuum, obeying some ancient brainstem override from a time when all monsters were earthbound, but by the time I remembered to use my trigger finger the labhab was already looming before me. *Rorschach* reared up behind it in the near distance, vast and malign. Dim green auroras writhed across its twisted surface like sheet lightning. *Mouths* opened and closed by the hundreds, viscous as bubbling volcanic mud, any one of them large enough to swallow *Theseus* whole. I barely noticed the flicker of motion just ahead of me, the silent eruption of dark mass from the collapsed inflatable. By the time Cunningham caught my eye he was already on his way, backlit against the ghastly corpselight flickering on *Rorschach's* skin.

I thought I saw him waving, but I was wrong. It was only the

scrambler wrapped around his body like a desperate lover, moving his arm back and forth while it ran the thrust pistol tethered to his wrist. *Bye-bye*, that arm seemed to say, *and fuck you, Keeton*.

I watched for what seemed like forever, but no other part of him moved at all.

Voices, shouting, ordering me back inside. I hardly heard them. I was too dumbfounded by the basic math, trying to make sense of the simplest subtraction.

Two scramblers. Stretch and Clench. Both accounted for, shot to pieces before my eyes.

"Keeton, do you read? Get back here! Acknowledge!"

"I—it can't be," I heard myself say. "There were only two—"

"Return to the ship immediately. Acknowledge."

"I—acknowledged..."

Rorschach's mouths snapped shut at once, as though holding a deep breath. The artefact began to *turn*, ponderously, a continent changing course. It receded, slowly at first, picking up speed, turning tail and running. *How odd*, I thought. *Maybe it's more afraid than we are...*

But then Rorschach blew us a kiss. I saw it burst from deep within the forest, ethereal and incandescent. It shot across the heavens and splashed against the small of *Theseus'* back, making a complete and utter fool of Amanda Bates. The skin of our ship *flowed* there, and opened like a mouth, and congealed in a soundless frozen scream.

YOU CANNOT PREVENT AND PREPARE FOR WAR AT THE
SAME TIME.

—ALBERT EINSTEIN

I HAVE NO idea whether the scrambler made it back home with its hard-won prize. There was so much lost distance to make

up, even if the emplacements didn't pick it off en route. Cunningham's pistol might have run out of fuel. And who knew how long those creatures could survive in vacuum anyway? Maybe there'd been no real hope of success, maybe that scrambler was dead from the moment it had gambled on staying behind. I never found out. It had dwindled and vanished from my sight long before *Rorschach* dove beneath the clouds and disappeared in turn.

There had always been three, of course. Stretch, and Clench, and the half-forgotten microwaved remains of a scrambler killed by an uppity grunt—kept on ice next to its living brethren, within easy reach of Cunningham's teleops. I tried to dredge half-glimpsed details from memory, after the fact: had both of those escapees been spheres, or had one been flattened along one axis? Had they thrashed, waved their limbs the way some panicky human might with no ground beneath him? Or had one, perhaps, coasted lifeless and ballistic until our guns destroyed the evidence?

At this point, it didn't really matter. What mattered was that at long last, everyone was on the same page. Blood had been drawn, war declared.

And *Theseus* was paralysed from the waist down.

Rorschach's parting shot had punched through the carapace at the base of the spine. It had just missed the ramscoop and the telematter assembly. It might have taken out Fab if it hadn't spent so many joules burning through the carapace, but barring some temporary pulse effects it left all critical systems pretty much operational. All it had done was weaken *Theseus*' backbone enough to make it snap in two should we ever burn hard enough to break orbit. The ship would be able to repair that damage, but not in time.

If it had been luck it would have been remarkable.

And now, its quarry disabled, *Rorschach* had vanished. It had everything it needed from us, for the moment at least. It had information: all the experiences and insights encoded in the salvaged limbs of its martyred spies. If Stretch-or-Clench's gamble had paid off it even had a specimen of its own now,

which all things considered we could hardly begrudge it. And so now it lurked invisibly in the depths, resting perhaps. Recharging.

But it would be back.

Theseus lost weight for the final round. We shut down the drum in a token attempt to reduce our vulnerable allotment of moving parts. The Gang of Four—uncommanded, unneeded, the very reason for their existence ripped away—retreated into some inner dialog to which other flesh was unwelcome. She floated in the observatory, her eyes closed as tightly as the leaded lids around her. I could not tell who was in control.

I guessed. "Michelle?"

"Siri—" Susan. "Just go."

Bates floated near the floor of the drum, windows arrayed externally across bulkhead and conference table. "What can I do?" I asked.

She didn't look up. "Nothing."

So I watched. Bates counted skimmers in one window—mass, inertia, any of a dozen variables that would prove far too constant should any of those shovelnosed missiles come at our throat. They had finally noticed us. Their chaotic electron-dance was shifting now, hundreds of thousands of colossal sledgehammers in sudden flux, reweaving into some ominous dynamic that hadn't yet settled into anything we could predict.

In another window *Rorschach's* vanishing act replayed on endless loop: a radar image receding deep into the maelstrom, fading beneath gaseous teratonnes of radio static. It might still be an orbit, of sorts. Judging by that last glimpsed trajectory *Rorschach* might well be swinging around Ben's core now, passing through crushed layers of methane and monoxide that would flatten *Theseus* into smoke. Maybe it didn't even stop there; maybe *Rorschach* could pass unharmed even through those vaster, deeper pressures that made iron and hydrogen run liquid.

We didn't know. We only knew that it would be back in a little under two hours, assuming it maintained its trajectory and survived the depths. And of course, it *would* survive. You can't

kill the thing under the bed. You can only keep it outside the covers.

And only for a while.

A thumbnail inset caught my eye with a flash of color. At my command it grew into a swirling soap bubble, incongruously beautiful, a blue-shifted coruscating rainbow of blown glass. I didn't recognize it for a moment: Big Ben, rendered in some prismatic false-color enhance I'd never seen before. I grunted softly.

Bates glanced up. "Oh. Beautiful, isn't it?"

"What's the spectrum?"

"Longwave stuff. Visible red, infra, down a ways. Good for heat traces."

"Visible red?" There wasn't any to speak of; mostly cool plasma fractals in a hundred shades of jade and sapphire.

"Quadrochromatic palette," Bates told me. "Like what a cat might see. Or a vampire." She managed a half-hearted wave at the rainbow bubble. "Sarasti sees something like that every time he looks outside. If he ever looks outside."

"You'd think he'd have mentioned it," I murmured. It was gorgeous, a holographic ornament. Perhaps even *Rorschach* might be a work of art through eyes like these...

"I don't think they parse sight like we do." Bates opened another window. Mundane graphs and contour plots sprang from the table. "They don't even go to Heaven, from what I hear. VR doesn't work on them, they— see the pixels, or something."

"What if he's right?" I asked. I told myself that I was only looking for a tactical assessment, an official opinion for the official record. But my words came out doubtful and frightened.

She paused. For a moment I wondered if she, too, had finally lost patience with the sight of me. But she only looked up, and stared off into some enclosed distance.

"What if he's right," she repeated, and pondered the question that lay beneath: *what can we do?*

"We could engineer ourselves back into nonsentience, perhaps. Might improve our odds in the long run." She looked

at me, a rueful sort of half-smile at the corner of her mouth. "But I guess that wouldn't be much of a win, would it? What's the difference between being dead, and just not knowing you're alive?"

I finally saw it.

How long would it take an enemy tactician to discern Bates' mind behind the actions of her troops on the battlefield? How long before the obvious logic came clear? In any combat situation, this woman would naturally draw the greatest amount of enemy fire: take off the head, kill the body. But Amanda Bates wasn't just a head: she was a bottleneck, and *her* body would not suffer from a decapitation strike. Her death would only let her troops off the leash. How much more deadly would those grunts be, once every battlefield reflex didn't have to pass through some interminable job stack waiting for the rubber stamp?

Szpindel had had it all wrong. Amanda Bates wasn't a sop to politics, her role didn't deny the obsolescence of Human oversight at all. Her role *depended* on it.

She was more cannon fodder than I. She always had been. And I had to admit: after generations of generals who'd lived for the glory of the mushroom cloud, it was a pretty effective strategy for souring warmongers on gratuitous violence. In Amanda Bates' army, picking a fight meant standing on the battlefield with a bull's-eye on your chest.

No wonder she'd been so invested in peaceful alternatives.

"I'm sorry," I said softly.

She shrugged. "It's not over yet. Just the first round." She took a long, deep breath, and turned back to her study of slingshot mechanics. "*Rorschach* wouldn't have tried so hard to scare us off in the first place if we couldn't touch it, right?"

I swallowed. "Right."

"So there's still a chance." She nodded to herself. "There's still a chance."

The demon arranged his pieces for the end game. He didn't have many left. The soldier he placed in the bridge. He packed obsolete linguists and diplomats back in their coffin, out of sight and out of the way.

He called the jargonaut to his quarters— and although it would be the first time I'd seen him since the attack, his summons carried not the slightest trace of doubt that I would obey. I did. I came on command, and saw that he had surrounded himself with faces.

Every last one of them was screaming.

There was no sound. The disembodied holograms floated in silent tiers around the bubble, each contorted into a different expression of pain. They were being tortured, these faces; half a dozen real ethnicities and twice as many hypothetical ones, skin tones ranging from charcoal to albino, brows high and slanted, noses splayed or pointed, jaws receding or prognathous. Sarasti had called the entire hominid tree into existence around him, astonishing in their range of features, terrifying in their consistency of expression.

A sea of tortured faces, rotating in slow orbits around my vampire commander.

"My God, what is this?"

"Statistics." Sarasti seemed focused on a flayed Asian child. "*Rorschach's* growth allometry over a two-week period."

"They're *faces*..."

He nodded, turning his attention to a woman with no eyes. "Skull diameter scales to total mass. Mandible length scales to EM transparency at one Angstrom. One hundred thirteen facial dimensions, each presenting a different variable. Principle-component combinations present as multifeature aspect ratios." He turned to face me, his naked gleaming eyes just slightly sidecast. "You'd be surprised how much gray matter is dedicated to the analysis of facial imagery. Shame to waste it on anything as—counterintuitive as residual plots or contingency tables."

I felt my jaw clenching. "And the *expressions*? What do *they* represent?"

"Software customizes output for user."

An agonized gallery pled for mercy on all sides.

"I *am* wired for hunting," he reminded gently.

"And you think I don't know that," I said after a moment.

He shrugged, disconcertingly human. "You ask."

"Why am I here, Jukka? You want to teach me another *object lesson*?"

"To discuss our next move."

"What move? We can't even run away."

"No." He shook his head, baring filed teeth in something approaching regret.

"Why did we wait so long?" Suddenly my sullen defiance had evaporated. I sounded like a child, frightened and pleading. "Why didn't we just take it on when we first got here, when it was *weaker*...?"

"We need to learn things. For next time."

"Next time? I thought *Rorschach* was a dandelion seed. I thought it just—washed up here—"

"By chance. But every dandelion is a clone. Their seeds are legion." Another smile, not remotely convincing— "And maybe it takes more than one try for the placental mammals to conquer Australia."

"It'll annihilate us. It doesn't even need those spitballs, it could pulverize us with one of those scramjets. In an instant."

"It doesn't want to."

"How do you *know*?"

"They need to learn things too. They want us intact. Improves our odds."

"Not enough. We can't win."

This was his cue. This was the point at which Uncle Predator would smile at my naiveté, and take me into his confidence. *Of course we're armed to the teeth*, he would say. *Do you think we'd come all this way, face such a vast unknown, without the means to defend ourselves? Now, at last, I can reveal that shielding and weaponry account for over half the ship's mass...*

It was his cue.

"No," he said. "We can't win."

"So we just sit here. We just wait to die for the next—the next sixty-eight minutes..."

Sarasti shook his head. "No."

"But—" I began.

"Oh," I finished.

Because of course, we had just topped up our antimatter reserves. *Theseus* was not equipped with weapons. *Theseus* was the weapon. And we were, in fact, going to sit here for the next sixty-eight minutes, waiting to die.

But we were going to take *Rorschach* with us when we did.

Sarasti said nothing. I wondered what he saw, looking at me. I wondered if there actually *was* a Jukka Sarasti behind those eyes to see, if his insights—always ten steps ahead of our own—hailed not so much from superior analytical facilities as from the timeworn truth that *it takes one to know one*.

Whose side, I wondered, would an automaton take?

"You have other things to worry about," he said.

He moved towards me; I swear, all those agonized faces followed him with their eyes. He studied me for a moment, the flesh crinkling around his eyes. Or maybe some mindless algorithm merely processed visual input, correlated aspect ratios and facial tics, fed everything to some output subroutine with no more awareness than a stats program. Maybe there was no more spark in this creature's face than there was in all the others, silently screaming in his wake.

"Is Susan afraid of you?" the thing before me asked.

"Su—why should she be?"

"She has four conscious entities in her head. She's four times more sentient than you. Doesn't that make you a threat?"

"No, of course not."

"Then why should you feel threatened by me?"

And suddenly I didn't care any more. I laughed out loud, with minutes to live and nothing to lose. "*Why?* Maybe because you're my natural enemy, you fucker. Maybe because I *know* you, and you can't even *look* at one of us without flexing your claws. Maybe because you nearly ripped my fucking hand off and raped me for no good reason—"

"I can imagine what it's like," he said quietly. "Please don't make me do it again."

I fell instantly silent.

"I know your race and mine are never on the best of terms." There was a cold smile in his voice if not on his face. "But I do only what you force me to. You *rationalize*, Keeton. You *defend*. You reject unpalatable truths, and if you can't reject them outright you trivialize them. Incremental evidence is never enough for you. You hear rumors of Holocaust; you dismiss them. You see evidence of genocide; you insist it can't be so bad. Temperatures rise, glaciers melt—species *die*—and you blame sunspots and volcanoes. Everyone is like this, but you most of all. You and your Chinese Room. You turn incomprehension into mathematics, you reject the truth without even knowing what it is."

"It served me well enough." I wondered at the ease with which I had put my life into the past tense.

"Yes, if your purpose is only to *transmit*. Now you have to *convince*. You have to *believe*."

There were implications there I didn't dare to hope for. "Are you saying—"

"Can't afford to let the truth *trickle* through. Can't give you the chance to shore up your rationales and your defenses. They must fall completely. You must be *inundated*. Shattered. Genocide's impossible to deny when you're buried up to your neck in dismembered bodies."

He'd *played* me. All this time. *Preconditioning* me, turning my topology inside-out.

I'd known something was going on. I just hadn't understood *what*.

"I'd have seen right through it," I said, "if you hadn't made me get involved."

"You might even read it off me directly."

"*That's* why you—" I shook my head. "I thought that was because we were *meat*."

"That too," Sarasti admitted, and looked right at me.

For the first time, I looked right back. And felt a shock of

recognition.

I still wonder why I never saw it before. For all those years I remembered the thoughts and feelings of some different, younger person, some remnant of the boy my parents had hacked out of my head to make room for me. He'd been *alive*. His world had been vibrant. And though I could call up the memories of that other consciousness, I could barely feel anything within the constraints of my own.

Perhaps *dreamstate* wasn't such a bad word for it...

"Like to hear a vampire folk tale?" Sarasti asked.

"Vampires have folk tales?"

He took it for a yes. "A laser is assigned to find the darkness. Since it lives in a room without doors, or windows, or any other source of light, it thinks this will be easy. But everywhere it turns it sees brightness. Every wall, every piece of furniture it points at is brightly lit. Eventually it concludes there is no darkness, that light is everywhere."

"What the hell are you talking about?"

"Amanda is not planning a mutiny."

"What? You know about—"

"She doesn't even want to. Ask her if you like."

"No—I—"

"You value objectivity."

It was so obvious I didn't bother answering.

He nodded as if I had. "Synthesists can't have opinions of their own. So when you feel one, it must be someone else's. The *crew* holds you in contempt. *Amanda* wants me relieved of command. Half of *us* is *you*. I think the word is *project*. Although,"—he cocked his head a bit to one side—"lately you improve. Come."

"Where?"

"Shuttle bay. Time to do your job."

"My—"

"Survive and bear witness."

"A drone—"

"Can deliver the data—assuming nothing fries its memory before it gets away. It can't *convince* anyone. It can't counter

rationalizations and denials. It can't *matter*. And vampires—" he paused—"have poor communications skills."

It should have been cause for petty, selfish rejoicing.

"It all comes down to me," I said. "That's what you're saying. I'm a fucking stenographer, and it's all on me."

"Yes. Forgive me for that."

"Forgive you?"

Sarasti waved his hand. All faces save two disappeared.

"I don't know what I'm doing."

The news bloomed across ConSensus a few seconds before Bates called it aloud: Thirteen skimmers had not reappeared from behind Big Ben on schedule. Sixteen. Twenty-eight.

And counting.

Sarasti clicked to himself as he and Bates played catch-up. Tactical filled with luminous multicolored threads, a tangle of revised projections as intricate as art. The threads wrapped Ben like a filamentous cocoon; *Theseus* was a naked speck in the middle distance.

I expected any number of those lines to skewer us like needles through a bug. Surprisingly, none did; but the projections only extended twenty-five hours into the future, and were reliable for only half that. Not even Sarasti and the Captain could look so far ahead with that many balls in the air. It was something, though, the faintest silver lining: that all these high-speed behemoths couldn't simply reach out and swat us without warning. Evidently they still had to ease into the curve.

After *Rorschach's* dive, I'd been starting to think the laws of physics didn't apply.

The trajectories were close enough, though. At least three skimmers would be passing within a hundred kilometers on their next orbits.

Sarasti reached for his injector, the blood rising in his face.

"Time to go. We refit *Charybdis* while you're sulking."

He held the hypo to his throat and shot up. I stared at ConSensus, caught by that bright shifting web like a moth by a streetlight.

"Now, Siri."

He pushed me from his quarters. I sailed into the passageway, grabbed a convenient rung—and stopped.

The spine was alive with grunts, patrolling the airspace, standing guard over the fab plants and shuttle 'locks, clinging like giant insects to the rungs of unrolling spinal ladders. Slowly, silently, the spine itself was *stretching*.

It could do that, I remembered. Its corrugations flexed and relaxed like muscle, it could grow up to two hundred meters to accommodate any late-breaking need for a bigger hanger or more lab space.

Or more infantry. *Theseus* was increasing the size of the battlefield.

"Come." The vampire turned aft.

Bates broke in from up front. "Something's happening."

An emergency handpad, gecked to the expanding bulkhead, slid past to one side. Sarasti grabbed it and tapped commands. Bates' feed appeared on the bulkhead: a tiny chunk of Big Ben, an EM-enhanced equatorial quadrant only a few thousand clicks on a side. The clouds boiled down there, a cyclonic knot of turbulence swirling almost too fast for realtime. The overlay described charged particles, bound in a deep Parker spiral. It spoke of great mass, rising.

Sarasti clicked.

"DTI?" Bates said.

"Optical only." Sarasti took my arm and dragged me effortlessly astern. The display paced us along the bulkhead: seven skimmers shot from the clouds as I watched, a ragged circle of scramjets screaming red-hot into space. ConSensus plotted their paths in an instant; luminous arcs rose around our ship like the bars of a cage.

Theseus shuddered.

We've been hit, I thought. Suddenly the spine's plodding

expansion cranked into overdrive; the pleated wall lurched and accelerated, streaming past my outstretched fingers as the closed hatch receded up ahead—

—receded *overhead*.

The walls weren't moving at all. We were *falling*, to the sudden strident bleating of an alarm.

Something nearly yanked my arm from its socket: Sarasti had reached out with one hand and caught a rung, reached with his other and caught me before we'd both been flattened against the Fab plant. We dangled. I must have weighed two hundred kilograms; the floor shuddered ten meters below my feet. The ship groaned around us. The spine filled with the screech of torquing metal. Bates' grunts clung to its walls with clawed feet.

I reached for the ladder. The ladder pulled away: the ship was bending in the middle and *down* had started to climb the walls. Sarasti and I swung towards the center of the spine like a daisy-chain pendulum.

"*Bates! James!*" The vampire roared. His grip on my wrist trembled, slipping. I strained for the ladder, swung, caught it.

"Susan James has barricaded herself in the bridge and shut down autonomic overrides." An unfamiliar voice, flat and affectless. "She has initiated an unauthorized burn. I have begun a controlled reactor shutdown; be advised that the main drive will be offline for at least twenty-seven minutes."

The ship, I realized, its voice raised calmly above the alarm. The Captain itself. On Public Address.

That was unusual.

"Bridge!" Sarasti barked. "Open channel!"

Someone was shouting up there. There were words, but I couldn't make them out.

Without warning, Sarasti let go.

He dropped obliquely in a blur. Aft and opposite, the bulkhead waited to swat him like an insect. In half a second both his legs would be shattered, if the impact didn't kill him outright—

But suddenly we were weightless again, and Jukka Sarasti—purple-faced, stiff-limbed— was foaming at the mouth.

"Reactor offline," the Captain reported. Sarasti bounced off the wall.

He's having a seizure, I realized.

I released the ladder and pushed astern. *Theseus* swung lopsidedly around me. Sarasti convulsed in mid-air; clicks and hisses and choking sounds stuttered from his mouth. His eyes were so wide they seemed lidless. His pupils were mirror-red pinpoints. The flesh twitched across his face as though trying to crawl off.

Ahead and behind, battlebots held their position and ignored us.

"*Bates!*" I yelled up the spine. "We need help!"

Angles, everywhere. Seams on the shield plates. Sharp shadows and protrusions on the surface of every drone. A two-by-three matrix of insets, bordered in black, floating over the main ConSensus display: two big interlinked crosses right in front of where Sarasti had been hanging.

This can't be happening. He just took his antiEuclideans. I saw him. Unless...

Someone had spiked Sarasti's drugs.

"*Bates!*" She should be linked into the grunts, they should have leapt forward at the first sign of trouble. They should be dragging my commander to the infirmary by now. They waited stolid and immobile. I stared at the nearest: "Bates, you there?" And then—in case she wasn't—I spoke to the grunt directly. "Are you autonomous? *Do you take verbal orders?*"

On all sides the robots watched; the Captain just laughed at me, its voice posing as an alarm.

Infirmary.

I pushed. Sarasti's arms flailed randomly against my head and shoulders. He tumbled forward and sideways, hit the moving ConSensus display dead center, bounced away up the spine. I kicked off in his wake—

—and glimpsed something from the corner of my eye—

—and turned—

—And dead center of ConSensus, *Rorschach* erupted from Ben's seething face like a breaching whale. It wasn't just the

EM-enhance: the thing was *glowing*, deep angry red. Enraged, it hurled itself into space, big as a mountain range.

Fuck fuck fuck.

Theseus lurched. The lights flickered, went out, came back on again. The turning bulkhead cuffed me from behind.

"Backups engaged," the Captain said calmly.

"Captain! Sarasti's down!" I kicked off the nearest ladder, bumped into a grunt and headed forward after the vampire. "Bates isn't—what do I do?"

"Nav offline. Starboard afferents offline."

It wasn't even talking to me, I realized. Maybe this wasn't the Captain at all. Maybe it was pure reflex: a dialog tree, spouting public-service announcements. Maybe *Theseus* had already been lobotomized. Maybe this was only her brain stem talking.

Darkness again. Then flickering light.

If the Captain was gone, we were screwed.

I gave Sarasti another push. The alarm bleated on. The drum was twenty meters ahead; BioMed was just the other side of that closed hatch. The hatch had been open before, I remembered. Someone had shut it in the last few minutes. Fortunately *Theseus* had no locks on her doors.

Unless the Gang barricaded it before they took the bridge...

"Strap in, people! We are getting *out* of here!"

Who in hell...?

The open bridge channel. Susan James, shouting up there. Or *someone* was; I couldn't quite place the voice...

Ten meters to the drum. *Theseus* jerked again, slowed her spin. Stabilised.

"*Somebody start the goddamned reactor!* I've only got attitude jets up here!"

"*Susan? Sascha?*" I was at the hatch. "Who is that?" I pushed passed Sarasti and reached to open it.

No answer.

Not from ConSensus, anyway. I heard a muted *hum* from behind, saw the ominous shifting of shadows on the bulkhead just a moment too late. I turned in time to see one of the grunts raise a spiky appendage—curved like a scimitar, needle-tipped

—over Sarasti's head.

I turned in time to see it plunge into his skull.

I froze. The metal proboscis withdrew, dark and slick. Lateral maxillipeds began nibbling at the base of Sarasti's skull. His pithed corpse wasn't thrashing now; it only trembled, a sack of muscles and motor nerves awash in static.

Bates.

Her mutiny was underway. No, *their* mutiny—Bates and the Gang. I'd known. I'd imagined it. I'd seen it coming.

He hadn't believed me.

The lights went out again. The alarm fell silent. ConSensus dwindled to a flickering doodle on the bulkhead and disappeared; I saw something there in that last instant, and refused to process it. I heard breath catch in my throat, felt angular monstrosities advancing through the darkness. Something flared directly ahead, a bright brief staccato in the void. I glimpsed curves and angles in silhouette, *staggering*. The buzzing crackle of shorting circuitry. Metal objects collided nearby, unseen.

From behind the crinkle of the drum hatch, opening. A sudden beam of harsh chemical light hit me as I turned, lit the mechanical ranks behind; they simultaneously unclamped from their anchorages and floated free. Their joints clicked in unison like an army stamping to attention

"*Keeton!*" Bates snapped, sailing through the hatch. "You okay?"

The chemlight shone from her forehead. It turned the interior of the spine into a high-contrast mosaic, all pale surfaces and sharp moving shadows. It spilled across the grunt that had killed Sarasti; the robot bounced down the spine, suddenly, mysteriously inert. The light washed across Sarasti's body. The corpse turned slowly on its axis. Spherical crimson beads emerged from its head like drops of water from a leaky faucet. They spread in a winding, widening trail, spot-lit by Bates' headlamp: a spiral arm of dark ruby suns.

I backed away. "You—"

She pushed me to one side. "Stay clear of the hatch, unless

you're going through." Her eyes were fixed on the ranked drones. "Optical line of sight."

Rows of glassy eyes reflected back at us down the passageway, passing in and out of shadow.

"You killed Sarasti!"

"No."

"But—"

"Who do you think shut it *down*, Keeton? The fucker went rogue. I could barely even get it to self-destruct." Her eyes went briefly deep-focus; all down the spine the surviving drones launched into some intricate martial ballet, half-seen in the shifting cone of her headlamp.

"Better," Bates said. "They should stay in line now. Assuming we don't get hit with anything too much stronger."

"What is hitting us?"

"Lightning. EMP." Drones sailed down to Fab and the shuttles, taking strategic positions along the tube. "*Rorschach's* putting out one hell of a charge and every time one those skimmers pass between us they *arc*."

"What, at *this* range? I thought we were—the burn—"

"Sent us in the wrong direction. We're inbound."

Three grunts floated close enough to touch. They drew beads on the open drum hatch.

"She said she was trying to *escape*—" I remembered.

"She fucked up."

"Not by *that* much. She couldn't have." We were all rated for manual piloting. Just in case.

"Not the Gang," Bates said.

"But—"

"I think there's someone new in there now. Bunch of submodules wired together and woke up somehow, I don't know. But whatever's in charge, I think it's just panicking."

Stuttering brightness on all sides. The spinal lightstrips flickered and finally held steady, at half their usual brightness.

Theseus coughed static and spoke: "ConSensus is offline. Reac—"

The voice faded.

ConSensus, I remembered as Bates turned to head back upstream.

"I saw something," I said. "Before ConSensus went out."

"Yeah."

"Was that—"

She paused at the hatch. "Yeah."

I'd seen scramblers. Hundreds of them, sailing naked through the void, their arms spread wide.

Some of their arms, anyway. "They were carrying—"

Bates nodded. "Weapons." Her eyes flickered to some unseen distance for a moment. "First wave headed for the front end. Blister and forward lock, I think. Second wave's aft." She shook her head. "Huh. I would have done it the other way around."

"How far?"

"Far?" Bates smiled faintly. "They're already on the hull, Siri. We're engaging."

"What do I do? *What do I do?*"

Her eyes stared past me, and widened. She opened her mouth.

A hand clamped on my shoulder from behind and spun me around.

Sarasti. His dead eyes stared from a skull split like a spiked melon. Globules of coagulating blood clung to his hair and skin like engorged ticks.

"Go with him," Bates said.

Sarasti grunted and clicked. There were no words.

"What—" I began.

"Now. That's an order." Bates turned back to the hatch. "We'll cover you."

The shuttle. "You too."

"No."

"Why not? They can fight better *without* you, you said that yourself! What's the *point*?"

"Can't leave yourself a back door, Keeton. Defeats the whole purpose." She allowed herself a small, sad smile. "They've breached. Go."

She was gone, fresh alarms rising in her wake. Far towards

the bow I heard the crinkle of emergency bulkheads snapping shut.

Sarasti's undead carcass gurgled and pushed me down the spine. Four more grunts slid smoothly past and took up position behind us. I looked over my shoulder in time to see the vampire pull the handpad from the wall. But it wasn't Sarasti at all, of course. It was the Captain—whatever was left of the Captain, this far into the fight—commandeering a peripheral interface for its own use. The optical port sprouted conspicuously from the back of Sarasti's neck, where the cable used to go in; I remembered the drone's maxillipeds, chewing.

The sound of weapons fire and ricochets rose behind us.

The corpse typed one-handed as we moved. I wondered briefly why it just didn't *talk* before my gaze flickered back to the spike in his brain: Sarasti's speech centers must be mush.

"Why did you kill him?" I said. A whole new alarm started up, way back in the drum. A sudden *breeze* tugged me backward for a moment, dissipated in the next second with a distant clang.

The corpse held out the handpad, configured for keys and a text display: Seizng. Cldnt cntrl.

We were at the shuttle locks. Robot soldiers let us pass, their attention elsewhere.

U GO, the Captain said.

Someone screamed in the distance. Way off up the spine, the drum hatch slammed shut; I turned and saw a pair of distant grunts welding the seal. They seemed to move faster now than they ever had before. Maybe it was only my imagination.

The starboard shuttle lock slid back. *Charybdis*' interior lights winked on, spilling brightness into the passageway; the spine's emergency lighting seemed even dimmer in contrast. I peered through the opening. There was almost no cabin space left—just a single open coffin jammed between coolant and fuel tanks and massive retrofitted shockpads. *Charybdis* had been refitted for high-G and long distance.

And me.

Sarasti's corpse urged me on from behind. I turned and faced

it.

"Was it *ever* him?" I asked.

Go.

"*Tell me.* Did he ever speak for himself? Did he decide *anything* on his own? Were we ever following *his* orders, or was it just you all along?"

Sarasti's undead eyes stared glassy and uncomprehending. His fingers jerked on the handpad.

U dislike ordrs frm mchnes. Happier ths way.

I let it strap me in and close the lid. I lay there in the dark, feeling my body lurch and sway as the shuttle slid into its launch slot. I withstood the sudden silence as the docking clamps let go, the jerk of acceleration that spat me hard into the vacuum, the ongoing thrust that pushed against my chest like a soft mountain. Around me the shuttle trembled in the throes of a burn that far exceeded its normative specs.

My inlays came back online. Suddenly I could see *outside* if I wanted. I could see what was happening behind me.

I chose not to, deliberately and fervently, and looked anyway.

Theseus was dwindling by then, even on tactical. She listed down the well, wobbling toward some enemy rendezvous that must have been intentional, some last-second maneuver to get her payload as close to target as possible. *Rorschach* rose to meet her, its gnarled spiky arms *uncoiling*, spreading as if in anticipation of an embrace. But it was the backdrop, not the players, that stole the tableau: the face of Big Ben roiling in my rearview, a seething cyclonic backdrop filling the window. Magnetic contours wound spring-tight on the overlay; *Rorschach* was drawing all of Ben's magnetosphere around itself like a bright swirling cloak, twisting it into a concentrated knot that grew and brightened and bulged outward...

Like a torsion flare from an L-class dwarf, my commander had said once, *but we should see anything big enough to generate that effect and the sky's dark on that bearing. IAU calls it a statistical artefact.*

As, in fact, it had been. An impact splash perhaps, or the

bright brief bellow of some great energy source rebooting after a million years of dormancy. Much like this one: a solar flare, with no sun beneath it. A magnetic cannon ten thousand times stronger than nature gave it any right to be.

Both sides drew their weapons. I don't know which fired first, or even if it mattered: how many tonnes of antimatter would it take to match something that could squeeze the power of a sun from a gas ball barely wider than Jupiter? Was *Rorschach* also resigned to defeat, had each side opted for a kamikaze strike on the other?

I don't know. Big Ben got in the way just minutes before the explosion. That's probably why I'm still alive. Ben stood between me and that burning light like a coin held against the sun.

Theseus sent everything it could, until the last microsecond. Every recorded moment of hand-to-hand combat, every last countdown, every last soul. All the moves and all the vectors. I have that telemetry. I can break it down into any number of shapes, continuous or discrete. I can transform the topology, rotate it and compress it and serve it up in dialects that any ally might be able to use. Perhaps Sarasti was right, perhaps some of it is vital.

I don't know what any of it means.

CHARYBDIS

SPECIES USED TO GO EXTINCT. NOW THEY GO ON HIATUS.

—DEBORAH MACLENNAN,

TABLES OF OUR RECONSTRUCTION

"YOU POOR GUY," Chelsea said as we went our separate ways. "Sometimes I don't think you'll *ever* be lonely." At the time I wondered why she sounded so sad.

Now, I only wish she'd been right.

I know this hasn't been a seamless narrative. I've had to shatter the story and string its fragments out along a death lasting decades. I live for only an hour of every ten thousand now, you see. I wish I didn't have to. If only I could sleep the whole way back, avoid the agony of these brief time-lapsed resurrections.

If only I wouldn't die in my sleep if I tried. But living bodies glitter with a lifetime's accumulation of embedded radioisotopes, brilliant little shards that degrade cellular machinery at the molecular level. It's not usually a problem. Living cells repair the damage as fast as it occurs. But my undead ones let those errors accumulate over time, and the journey home takes so much longer than the trip out: I lie in stasis and *corrode*. So the onboard kick-starts me every now and then to give my flesh the chance to stitch itself back together.

Occasionally it talks to me, recites system stats, updates me on any chatter from back home. Mostly, though, it leaves me alone with my thoughts and the machinery ticking away where my left hemisphere used to be. So I talk to myself, dictate history and opinion from real hemisphere to synthetic one: bright brief moments of awareness, long years of oblivious

decay between. Maybe the whole exercise is pointless from the start, maybe no one's even listening.

It doesn't matter. This is what I *do*.

So there you have it: a memoir told from meat to machinery. A tale told to myself, for lack of someone else to take an interest.

Anyone with half a brain could tell it.

I got a letter from Dad today. General delivery, he called it. I think that was a joke, in deference to my lack of known address. He just threw it omnidirectionally into the ether and hoped it would wash over me, wherever I was.

It's been almost fourteen years now. You lose track of such things out here.

Helen's dead. Heaven—malfunctioned, apparently. Or was sabotaged. Maybe the Realists finally pulled it off. I doubt it, though. Dad seemed to think someone else was responsible. He didn't offer up any details. Maybe he didn't know any. He spoke uneasily of increasing unrest back home. Maybe someone leaked my communiqués about *Rorschach*; maybe people drew the obvious conclusion when our postcards stopped arriving. They don't know how the story ended. The lack of closure must be driving them crazy.

But I got the sense there was something else, something my father didn't dare speak aloud. Maybe it's just my imagination; I thought he even sounded troubled by the news that the birth rate was rising again, which should be cause for celebration after a generation in decline. If my Chinese Room was still in proper working order I'd *know*, I'd be able to parse it down to the punctuation. But Sarasti battered my tools and left them barely functional. I'm as blind now as any baseline. All I have is uncertainty and suspicion, and the creeping dread that even with my best tricks in tatters, I might be reading him right.

I think he's warning me to stay away.

He also said he loved me. He said he missed Helen, that she was sorry for something she did before I was born, some indulgence or omission that carried developmental consequences. He rambled. I don't know what he was talking about. So much power my father must have had, to be able to authorize such a broadcast and yet waste so much of it on feelings.

Oh God, how I treasure it. I treasure every word.

I fall along an endless futile parabola, all gravity and inertia. *Charybdis* couldn't reacquire the antimatter stream; Icarus has either been knocked out of alignment or shut off entirely. I suppose I could radio ahead and ask, but there's no hurry. I'm still a long way out. It will be years before I even leave the comets behind.

Besides, I'm not sure I want anyone to know where I am.

Charybdis doesn't bother with evasive maneuvers. There'd be no point even if it had the fuel to spare, even if the enemy's still out there somewhere. It's not as though they don't know where Earth is.

But I'm pretty sure the scramblers went up along with my own kin. They played well. I admit it freely. Or maybe they just got lucky. An accidental hiccough tickles Bates' grunt into firing on an unarmed scrambler; weeks later, Stretch & Clench use that body in the course of their escape. Electricity and magnetism stir random neurons in Susan's head; further down the timeline a whole new persona erupts to take control, to send *Theseus* diving into *Rorschach's* waiting arms. Blind stupid random chance. Maybe that's all it was.

But I don't think so. Too many lucky coincidences. I think *Rorschach* made its own luck, planted and watered that new persona right under our noses, safely hidden—but for the

merest trace of elevated oxytocin— behind all the lesions and tumors sewn in Susan's head. I think it looked ahead and saw the uses to which a decoy might be put; I think it sacrificed a little piece of itself in furtherance of that end, and made it look like an accident. Blind maybe, but not luck. Foresight. Brilliant moves, and subtle.

Not that most of us even knew the rules of the game, of course. We were just pawns, really. Sarasti and the Captain— whatever hybridized intelligence those two formed—they were the *real* players. Looking back, I can see a few of their moves too. I see *Theseus* hearing the scramblers tap back and forth in their cages; I see her tweak the volume on the Gang's feed so that Susan hears it too, and thinks the discovery her own. If I squint hard enough, I even glimpse *Theseus* offering us up in sacrifice, deliberately provoking *Rorschach* to retaliation with that final approach. Sarasti was always enamored of data, especially when it had *tactical significance*. What better way to assess one's enemy than to observe it in combat?

They never told us, of course. We were happier that way. We disliked orders from machines. Not that we were all that crazy about taking them from a vampire.

And now the game is over, and a single pawn stands on that scorched board and its face is human after all. If the scramblers follow the rules that a few generations of game theorists have laid out for them, they won't be back. Even if they are, I suspect it won't make any difference.

Because by then, there won't be any basis for conflict.

I've been listening to the radio during these intermittent awakenings. It's been generations since we buried the Broadcast Age in tightbeams and fiberop, but we never completely stopped sowing EM throughout the heavens. Earth, Mars, and Luna conduct their interplanetary dialog in a million overlapping voices. Every ship cruising the void speaks in all directions at once. The O'Neils and the asteroids never stopped singing. The Fireflies might never have found us if they had.

I've heard those songs changing over time, a fast-forward time-lapse into oblivion. Now it's mostly traffic control and

telemetry. Every now and then I still hear a burst of pure voice, tight with tension, just short of outright panic more often than not: some sort of pursuit in progress, a ship making the plunge into deep space, other ships in dispassionate pursuit. The fugitives never seem to get very far before their signals are cut off.

I can't remember the last time I heard music but I hear something like it sometimes, eerie and discordant, full of familiar clicks and pops. My brainstem doesn't like it. It scares my brainstem to death.

I remember my whole generation abandoning the real world for a bootstrapped Afterlife. I remember someone saying *Vampires don't go to Heaven*. They see the pixels. Sometimes I wonder how I'd feel, brought back from the peace of the grave to toil at the pleasure of simpleminded creatures who had once been no more than protein. I wonder how I'd feel if my disability had been used to keep me leashed and denied my rightful place in the world.

And then I wonder what it would be like to feel nothing at all, to be an utterly rational, predatory creature with meat putting itself so eagerly to sleep on all sides...

I can't miss Jukka Sarasti. God knows I try, every time I come online. He saved my life. He — humanized me. I'll always owe him for that, for however long I live; and for however long I live I'll never stop hating him for the same reason. In some sick surrealistic way I had more in common with Sarasti than I did with any human.

But I just don't have it in me. He was a predator and I was prey, and it's not in the nature of the lamb to mourn the lion. Though he died for our sins, I cannot miss Jukka Sarasti.

I can empathize with him, though. At long long last I can empathise, with Sarasti, with all his extinct kind. Because we humans were never meant to inherit the Earth. Vampires were.

They must have been sentient to some degree, but that semi-aware dream state would have been a rudimentary thing next to our own self-obsession. They were weeding it out. It was just a phase. They were on their way.

The thing is, humans can look at crosses without going into convulsions. That's evolution for you; one stupid linked mutation and the whole natural order falls apart, intelligence and self-awareness stuck in counterproductive lock-step for half a million years. I think I know what's happening back on Earth, and though some might call it genocide it isn't really. We did it to ourselves. You can't blame predators for being predators. We were the ones who brought them back, after all. Why *wouldn't* they reclaim their birthright?

Not genocide. Just the righting of an ancient wrong.

I've tried to take some comfort in that. It's—difficult. Sometimes it seems as though my whole life's been a struggle to reconnect, to regain whatever got lost when my parents killed their only child. Out in the Oort, I finally won that struggle. Thanks to a vampire and a boatload of freaks and an invading alien horde, I'm Human again. Maybe the last Human. By the time I get home, I could be the only sentient being in the universe.

If I'm even that much. Because I don't know if there is such a thing as a reliable narrator. And Cunningham said zombies would be pretty good at faking it.

So I can't really tell you, one way or the other.

You'll just have to imagine you're Siri Keeton.

ECHOPRAXIA

For the BUG.
Who saved my life.

WE DO NOT DESTROY RELIGION BY DESTROYING SUPER-
STITION.

—CICERO

TO CONCENTRATE ON HEAVEN IS TO CREATE HELL.

—TOM ROBBINS

We climbed this hill. Each step up we could see farther, so of course we kept going. Now we're at the top. Science has been at the top for a few centuries now. And we look out across the plain and we see this other tribe dancing around above the clouds, even higher than we are. Maybe it's a mirage, maybe it's a trick. Or maybe they just climbed a higher peak we can't see because the clouds are blocking the view. So we head off to find out— but every step takes us downhill. No matter what direction we head, we can't move off our peak without losing our vantage point. So we climb back up again. We're trapped on a local maximum.

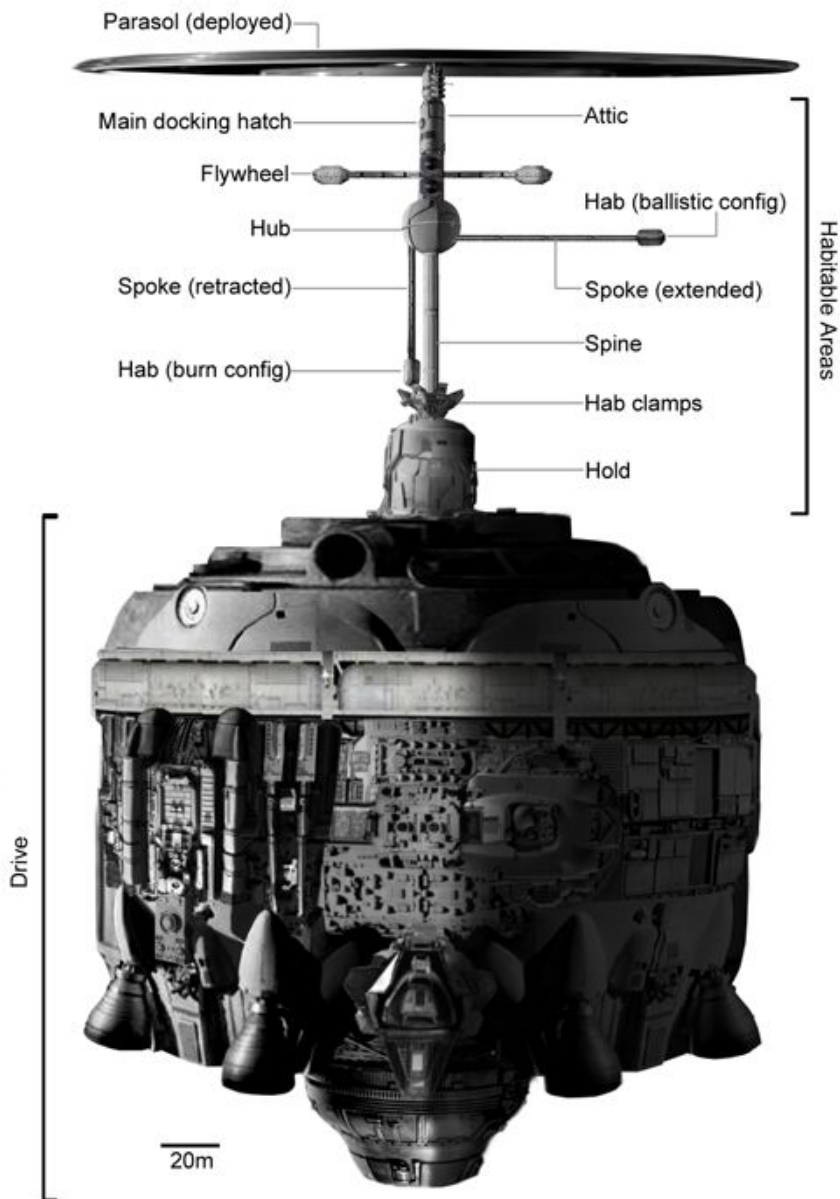
But what if there *is* a higher peak out there, way across the plain? The only way to get there is to bite the bullet, come down off our foothill and trudge along the riverbed until we finally start going uphill again. And it's only then you realize: Hey, this mountain reaches *way* higher than that foothill we were on before, and we can see so much better from up here.

But you can't get there unless you leave behind all the tools that made you so successful in the first place. You have to take that first step downhill.

—Dr. Lianna Lutterodt, “Faith and the Fitness Landscape,” *In Conversation*, 2091

The Crown of Thorns External Layout

Note: for clarity, only two of the six spoke-hab assemblies are shown.



PRELUDE

IT IS ALMOST IMPOSSIBLE SYSTEMATICALLY TO CONSTITUTE A NATURAL MORAL LAW. NATURE HAS NO PRINCIPLES. SHE FURNISHES US WITH NO REASON TO BELIEVE THAT HUMAN LIFE IS TO BE RESPECTED. NATURE, IN HER INDIFFERENCE, MAKES NO DISTINCTION BETWEEN GOOD AND EVIL.

—ANATOLE FRANCE

A WHITE ROOM, innocent of shadow or topography. No angles: that's crucial. No corners or intrusions of furniture, no directional lighting, no geometries of light and shadow whose intersection, from any viewpoint, might call forth the Sign of the Cross. The walls—wall, rather—was a single curved surface, softly bioluminescent, a spheroid enclosure flattened at the bottom in grudging deference to biped convention. It was a giant womb three meters across, right down to the whimpering thing curled up on the floor.

A womb, with all the blood on the outside.

Her name was Sachita Bhar and all that blood was in her head, too. By now they'd killed the cameras just like everything else but there was no way to take back the images from those first moments: the lounge, the Histo lab, even the *broom closet* for chrissakes, a grungy little cubby on the third floor where Gregor had hidden. Sachie hadn't been watching when Gregor had been found. She'd been flipping through the channels, frantically scanning for life and finding only the dead, their insides all out now. By the time she'd cycled through to the closet feed the monsters had already been and gone.

Gregor, who was in love with that stupid pet ferret of his.

She'd shared an elevator with him this morning. She remembered the stripes on his shirt. Otherwise she'd have had no idea what to call the mess in the closet.

She'd seen some fraction of the carnage before the cameras went down: friends and colleagues and rivals cut down without remorse or favoritism, their gutted remains sprawled across lab benches and workstations and toilet stalls. And with all those feeds running through the implants in her head—with all her access to all that ubiquitous surveillance—Sachita Bhar had not caught so much as a glimpse of the creatures who'd done this. Shadows, at most. A flicker of darkness cast by some solitary stalker from a blind spot in the camera's eye. They'd done it all without ever being seen, without ever seeing each *other*.

They'd always been kept isolated. For their own good, of course: stick two vampires in the same room and their own hardwired territoriality would put them at each other's throats in an instant. And yet they were working together, somehow. At least half a dozen, confined, incommunicado, acting in sudden precise concert. They'd done it all without ever meeting face-to-face—and even at the height of the slaughter, in those last moments before the cameras died, they had remained invisible. The whole massacre had happened from the corner of Sachie's eye.

How did they do it? How did they survive the angles?

Someone else might have enjoyed the irony; she hid in a refuge for monsters, one of the few places in the whole damn building where they could open their eyes without risking a death sentence. Right angles were *verboden* here. This was where Achilles' heels were put to the test, a cross-free zone where geometry was precisely controlled and neurological leashes optimized. Elsewhere, civilized geometry threatened on all sides: tabletops, windowpanes, a million intersections of appliance and architecture just waiting for the right viewpoint to send vampires into convulsions. Those monsters wouldn't—

—*shouldn't*—

—last an hour out there without the antiEuclidean that suppressed the Crucifix Glitch. Only here, in the white womb—

where poor, stupid Sachita Bhar had run when the lights went out—could they dare to open unprotected eyes.

And now one of them was in here with her.

She couldn't see it. Her own eyes were shut, squeezed tight against the butchery flash-burned into her head. She heard no sound but the endless animal keening in her own throat. But something drank a little of the light falling on her face. The swirling red darkness inside her eyelids dimmed some infinitesimal, telltale fraction, and she *knew*.

"Hello," it said.

She opened her eyes. It was one of the females: Valerie, they'd named her, after some departmental chairman who'd retired the year before. Valerie the Vampire.

Valerie's eyes red-shifted the light and threw it back at her, blood-orange stars in a face flushed with aftermath. She towered over Sachie like an insectile statue, motionless, even her breathing imperceptible. Moments from death and with nothing better to do, some subroutine in Sachie's head ticked off the morphometrics: such inhumanly long limbs, the attenuate heat-dissipating allometry of a metabolic engine running *hot*. Subtly jutting mandible, lupine as a hominid's could be, to hold all those teeth. Stupid turquoise smock, smart-paper/telemetry composite weave: Valerie must have been scheduled for physio work today. Ruddy complexion, the bloody flash-flood vasodilation of the predator in hunting mode. And the eyes, those terrifying luminous pinpoints—

Finally it registered: *Contracted pupils.*

She's not on Auntie U...

Suddenly Sachie's cross was out, last-ditch kill switch, the talisman everyone got on day one along with their ID: empirically tested, proven in the crunch, redeemed by science after uncounted centuries spent slumming as a religious fetish. Sachie held it up with sudden desperate bravado, thumbed the stud. Spring-loaded extensions shot from each tip and her little pocket totem was suddenly a meter on a side.

Thirty degrees of visual arc, Sachie. Maybe forty for the tough ones. Make sure it's perpendicular to line of sight, the angles only

work when they're close to ninety degrees, but once this little baby covers enough arc the visual cortex fries like a circuit in a shitstorm...

Greg's words.

Valerie cocked her head and studied the artifact. Any second now, Sachie knew, this nightmare creature would collapse in a twitching mass of tetany and shorting synapses. That wasn't faith; it was *neurology*.

The monster leaned close, and didn't even shiver. Sachita Bhar pissed herself.

"Please," she sobbed. The vampire said nothing.

Words flooded out: "I'm sorry, I was never really part of it, you know, I'm just a research associate, I'm just doing it for my degree, that's all, I know it's wrong, I know it's like, like *slavery* almost, I know that and it's a shitty system, it's a *shitty* thing we did to you but it wasn't really *me*, do you understand? I didn't make *any* of those decisions, I just came in afterward, I'm barely involved, it was just for my *degree*. And I—I can understand how you must feel, I can understand why you'd hate us, I would too probably but please, oh *please*, I'm just... I'm just a *student*..."

After a while, still alive, she dared to look up again. Valerie was staring at some point just to the left and a thousand light-years away. She seemed distracted. But then they always seemed distracted, their minds running a dozen parallel threads simultaneously, a dozen perceptual realities, each every bit as *real* as the one mere humans occupied.

Valerie cocked her head as if listening to faint music. She almost smiled.

"Please...", Sachie whispered.

"Not angry," Valerie said. "Don't want revenge. You don't matter."

"You don't—but..." Bodies. Blood. A building full of corpses and the monsters who'd made them. "What do you want, then? Anything, please, I'll—"

"Want you to imagine something: Christ on the Cross."

And of course, once the image had been incanted it was

impossible *not* to imagine. Sachita Bhar had a few moments to wonder at the sudden spasms seizing her limbs, at the way her jaw locked into startling dislocation, at the feel of a thousand blood-hot strokes exploding like pinpricks across the back of her skull. She tried to close her eyes but it doesn't matter what kind of light falls on the retina, that's not *vision*. The mind generates its own images, much farther upstream, and there's no way to shut those out.

"Yes." Valerie clicked thoughtfully to herself. "I learn."

Sachie managed to speak. It was the hardest thing she'd ever done, but she knew that was fitting; it was also the *last* thing she would ever do. So she summoned all her willpower, every shred of every reserve, every synapse that hadn't already been commandeered for self-destruction, and she spoke. Because nothing else mattered anymore, and she really wanted to know:

"Learn...wha..."

She couldn't quite get it out. But the short-circuiting brain of Sachita Bhar managed to serve up one last insight anyway, amid the rising static: *This is what the Crucifix Glitch feels like. This is what we do to them. This is...*

"Judo," Valerie whispered.

PRIMITIVE

Ultimately, all science is correlation. No matter how effectively it may use one variable to describe another, its equations will always ultimately rest upon the surface of a black box. (Saint Herbert might have put it most succinctly when he observed that all proofs inevitably reduce to propositions that have no proof.) The difference between Science and Faith, therefore, is no more and no less than *predictive power*. Scientific insights have proven to be better predictors than Spiritual ones, at least in worldly matters; they prevail not because they are true, but simply because they *work*.

The Bicameral Order represents a stark anomaly in this otherwise consistent landscape. Their explicitly faith-based methodologies venture unapologetically into metaphysical realms that defy empirical analysis—yet they yield results with consistently more predictive power than conventional science. (How they do this is not known; our best evidence suggests some kind of rewiring of the temporal lobe in a way that amplifies their connection to the Divine.)

It would be dangerously naïve to regard this as a victory for traditional religion. It is not. It is a victory for a radical sect barely half a century old, and the cost of that victory has been to demolish the wall between Science and Faith. The Church's concession of the physical realm informed the historic armistice that has allowed faith and reason to coexist to this day. One may find it heartening to see faith ascendant once again across the Human spectrum; but it is not *our* faith. Its hand still guides lost sheep away from the soulless empiricism of secular science, but the days in which it guided them into the loving arms of Our Savior are waning.

—*An Enemy Within: The Bicameral Threat to
Institutional Religion in the Twenty-First Century*
(An Internal Report to the Holy See by
the Pontifical Academy of Sciences, 2093)

ALL ANIMALS ARE UNDER STRINGENT SELECTION
PRESSURE TO BE AS STUPID AS THEY CAN GET AWAY
WITH.

—PETE RICHERSON AND ROBERT BOYD

DEEP IN THE Oregon desert, crazy as a prophet, Daniel Brüks opened his eyes to the usual litany of death warrants.

It had been a slow night. A half-dozen traps on the east side were offline—damn booster station must have gone down again—and most of the others were empty. But number eighteen had caught a garter snake. A sage grouse pecked nervously at the lens in number thirteen. The video feed from number four wasn't working, but judging by mass and thermal there was probably a juvenile *Scleroperus* scrambling around in there. Twenty-three had caught a hare.

Brüks hated doing the hares. They smelled awful when you cut them open—and these days, you almost always had to cut them open.

He sighed and described a semicircle with his index finger; the feeds vanished from the skin of his tent. Headlines resolved in their wake, defaulting to past interests: Pakistan's ongoing zombie problem; first anniversary of the Redeemer blowout; a sad brief obituary for the last wild coral reef.

Nothing from Rho.

Another gesture and the fabric lit with soft tactical overlays, skewed to thermal: public-domain real-time satellite imagery of the Prineville Reserve. His tent squatted in the center of the display, a diffuse yellow smudge: cold crunchy outer shell, warm chewy center. No comparable hot spots anywhere else in range. Brüks nodded to himself, satisfied. The world continued to leave him alone.

Outside, invisible in the colorless predawn, some small creature skittered away across loose rattling rock as he emerged. His breath condensed in front of him; frost crunched beneath his boots, bestowed a faint transient sparkle to the

dusty desert floor. His ATB leaned against one of the scraggly larches guarding the camp, marshmallow tires soft and flaccid.

He grabbed mug and filter from their makeshift hook and stepped into the open, down a loose jumble of scree. The vestiges of some half-assed desert stream quenched his thirst at the foot of the slope, slimy and sluggish and doomed to extinction within the month. Enough to keep one large mammal watered in the meantime. Out across the valley the Bicamerals' pet tornado squirmed feebly against a gray eastern sky but stars were still visible overhead, icy, unwinking, and utterly meaningless. Nothing up there tonight but entropy, and the same imaginary shapes that people had been imposing on nature since they'd first thought to wonder at the heavens.

It had been a different desert fourteen years ago. A different night. But it had *felt* the same, until the moment he'd glanced up—and for a few shattering moments it had even been a different *sky*, robbed of all randomness. A sky where every star blazed in brilliant precise formation, where every constellation was a perfect square no matter how desperately human imaginations might strain. February 13, 2082. The night of First Contact: sixty-two thousand objects of unknown origin, clenching around the world in a great grid, screaming across the radio spectrum as they burned. Brüks remembered the feeling: as though he were witnessing some heavenly coup, a capricious god deposed and order restored.

The revolution had lasted only a few seconds. The upstaged constellations had reasserted themselves as soon as those precise friction trails had faded from the upper atmosphere. But the damage had been done, Brüks knew. The sky would never look the same again.

That's what he'd thought at the time, anyway. That's what everyone had thought. The whole damn species had come together in the wake of that common threat, even if they didn't know what it was exactly, even if it hadn't actually *threatened* anything but Humanity's own self-importance. The world had put its petty differences aside, spared no expense, thrown together the best damn ship the twenty-first century could

muster. They'd crewed it with expendable bleeding-edgers and sent them off along some best-guess bearing, carrying a phrase book that spelled *take me to your leader* in a thousand languages.

The world had been holding its breath for over a decade now, waiting for the Second Coming. There'd been no encore, no second act. Fourteen years is a long time for a species raised on instant gratification. Brüks had never considered himself a great believer in the nobility of the Human spirit but even he had been surprised at how little time it took for the sky to start looking the same as it always had, at the speed with which the world's petty differences returned to the front page. People, he reflected, were like frogs: take something out of their visual field, and they'd just—forget it.

The *Theseus* mission would be well past Pluto by now. If it had found anything, Brüks hadn't heard about it. For his part, he was sick of waiting. He was sick of life on hold, waiting for monsters or saviors to make an appearance. He was sick of killing things, sick of dying inside.

Fourteen years.

He wished the world would just hurry up and end.

He spent the morning as he'd spent every other for the past two months: running his traplines and poking the things inside, in the faint hope of finding some piece of nature left untwisted.

The clouds were already closing in by sunrise, before his bike had soaked up a decent charge; he left it behind and ran the transects on foot. It was almost noon by the time he got to the hare, only to find that something had beaten him to the punch. The trap had been torn open and its contents emptied by some other predator who'd lacked even the good grace to leave a blood spatter behind for analysis.

The garter snake was still slithering around in number eighteen, though: a male, one of those brown-on-brown morphs that vanished against the dirt. It writhed in Brüks's grasp, clenched around his forearm like a scaly tentacle; its scent

glands smeared stink across his skin. Brüks drew a few microliters of blood without much hope, plugged them into the barcoder on his belt. He swigged from his canteen while the device worked its magic.

Far across the desert the monastery's tornado had swollen to three times its predawn size, pumped by the midday heat. Distance reduced it to a brown thread, an insignificant smoky smudge; but get too close to that funnel and you'd end up scattered over half the valley. Just the year before, some Ugandan vendetta theocracy had hacked a transAt shuttle out of Dartmouth, sent it through a vortex engine on the outskirts of Johannesburg. Not much but rivets and teeth had come out the other side.

The barcoder meeped in plaintive surrender: too many genetic artifacts for a clean read. Brüks sighed, unsurprised. The little machine could tag any gut parasite from the merest speck of shit, ID any host species from the smallest shred of pure tissue—but pure tissue was so hard to come by, these days. There was always something that didn't belong. Viral DNA, engineered for the greater good but too indiscriminate to stay on target. Special marker genes, designed to make animals glow in the dark when exposed to some toxin the EPA had lost interest in fifty years before. Even DNA computers, custom-built for a specific task and then tramped carelessly into wild genotypes like muddy footprints on a pristine floor. Nowadays it seemed like half the technical data on the planet were being stored genetically. Try sequencing a lung fluke and it was even money whether the base pairs you read would code for protein or the technical specs on the Denver sewer system.

It was okay, though. Brüks was an old man, a field man from a day when people could tell what they were looking at by—well, by *looking* at it. Check the chin shields. Count the fin rays, the hooks on the scolex. Use your eyes, dammit. At least if you screw up you've only got yourself to blame, not some dumb-ass machine that can't tell the difference between cytochrome oxidase and a Shakespearean sonnet. And if the things you're trying to ID happen to live inside *other* things, you kill the host.

You cut it open.

Brüks was good at that, too. He'd never got around to liking it much, though.

Now he whispered to his latest victim—"Shhh...sorry...it won't hurt, I promise..."—and dropped it into the kill sack. He'd found himself doing that a lot lately, murmuring meaningless comforting lies to victims who couldn't possibly understand what he was saying. He kept telling himself to grow up. In all the billions of years that life had been iterating on this planet, had any predator ever tried to comfort its prey? Had "natural" death ever been so quick and painless as the killings Dan Brüks inflicted for the greater good? And yet it still bothered him to see those small diffuse shadows flopping and squirming behind the translucent white plastic, to hear the soft thumps and hisses as simple minds tried to drive bodies, suddenly and terrifyingly unresponsive, toward some kind of imaginary escape.

At least these deaths served a purpose, some constructive end transcending the disease or predation that nature would have inflicted. Life was a struggle to exist at the expense of other life. Biology was a struggle to understand life. And this particular bit of biology, this study of which he was author, principal, and sole investigator—this was a struggle to use biology to help the very populations he was sampling. These deaths were the closest that Darwin's universe would ever come to altruism.

And that, said the little voice that always seemed to boot up at times like this, is so much shit. The only thing you're struggling to do is wring a few more publications out of your grant before the funding dries up. Even if you nailed down every change inflicted on every clade over the past hundred years, even if you quantified species loss down to the molecules, it wouldn't matter.

Nobody cares. The only thing you're struggling against is reality.

That voice had become his constant companion over the years. He let it rant. *Either way, he told it after it had run down, we're a shitty biologist.* And while his own guilty plea came easily enough, he could not bring himself to feel shame on that account.

It had stopped being a snake by the time he got back to camp. He stretched the limp and lifeless remains along the dissecting tray. Four seconds with the scasers and it was gutted, throat to cloaca; twenty more and the GI and respiratory tracts floated in separate watch glasses. The intestine would have the heaviest parasite load; Brüks loaded the GI tract into the 'scope and got to work.

Twenty minutes later, a retinue of flukes and cestodes only half-cataloged, something exploded in the distance.

That's what it sounded like, anyway: the soft muffled *whoompf* of far-off ordinance. Brüks rose from his work, panned the desert between spindly gnarled trunks.

Nothing. Nothing. Noth—

Oh, wait...

The monastery.

He grabbed his goggles off the ATB and zoomed in. The tornado was the first thing to draw his eye—

—*That thing's going pretty strong for so late in the day—*

—but off to the right, directly over the monastery itself, a puff of dark brown smoke roiled and drifted and dissipated in the lowering light.

The building didn't seem to be damaged, though. At least, none of the façades he could see.

What are they doing over there?

Physics, officially. Cosmology. High-energy stuff. But it was all supposed to be theoretical; as far as Brüks knew the Bicameral Order didn't perform actual experiments. Of course, hardly anyone did, these days. It was machines that scanned the heavens, machines that probed the space between atoms, machines that asked the questions and designed the experiments to answer them. All that was left for mere meat, apparently, was navel-gazing: to sit in the desert and contemplate whatever answers those machines served up. Although most still preferred to call it *analysis*.

A hive mind that spoke in tongues: that was how the Bicamerals did it, supposedly. Some kind of bioradio in their heads, a communal corpus callosum: electrons jiggling around

in microtubules, some kind of quantum-entanglement thing. Completely organic to get around the ban on B2B interfaces. A spigot that poured many minds into one on command. They flowed together and called down the Rapture, rolled around the floor and drooled and ululated while their acolytes took notes, and somehow they ended up rewriting the Amplituhedron.

There was supposed to be some rational explanation to justify the mumbo jumbo. Left-hemisphere pattern-matching subroutines amped beyond recognition; the buggy wetware that made you see faces in clouds or God's wrath in thunderstorms, tweaked to walk some fine line between insight and pareidolia. Apparently there were fundamental insights to be harvested along that razor's edge, patterns that only the Bicamerals could distinguish from hallucination. That was the story, anyway. It sounded like utter bullshit to Brüks.

Still, you couldn't argue with the Nobels.

Maybe they had some kind of particle accelerator over there after all. They had to be doing *something* that sucked a lot of energy; nobody used an industrial vortex engine to run kitchen appliances.

From behind, the metallic tinkle of displaced instruments. Brüks turned.

His scasers lay in the dirt. On the bench above them the gutted snake watched him upside down from its dissecting tray, forked tongue flickering.

Nerves, Brüks told himself.

The discarded carcass shivered on its back, as if the gash down its belly had let in the cold. Flaps of tissue rippled along either edge of that wound, a slow peristaltic wave undulating along the length of the body.

Galvanic skin response. That's all it is.

The snake's head lurched up over the edge of the tray. Glassy, unblinking eyes looked this way and that. The tongue, red-black, black-red, tasted the air.

The animal crawled from the pan.

It wasn't having an easy time of it. It kept trying to roll and crawl on its belly but it didn't *have* a belly, not anymore. The

ventral scales that would have pushed it along, the muscles beneath had been sliced apart, every one. And so the creature would manage a half twist every now and then, and fail, and resort to crawling on its back: eyes wide, tongue flicking, insides emptied.

The snake reached the edge of the bench, feebly wavered a moment, dropped into the dust. Brüks's boot came down on its head. He ground it deep against the rocky soil until there was nothing left but a moist sticky clot in the dirt. The rest of the creature writhed, its muscles jumping to the beat of nerves jammed with noise and no signal. But at least there was nothing left that could possibly please-God *feel*.

Reptiles were not especially fragile creatures. More than once Brüks had found rattlesnakes on the road hours from the nearest vehicle, spines crushed, fangs shattered, heads reduced to bloody paste—still moving, still crawling for the ditch. The kill sack was supposed to prevent that kind of protracted agony. You turned the animal's own metabolism against it, let lungs and capillaries carry the poison to every cell of every tissue, bringing a quick and painless and—most of all—a *complete* death, so that it would not wake up and fucking *look* at you, and try to *escape*, an hour after you'd scraped its insides away.

Of course, there were zombies in the world now. Vampires, too, for that matter. But the twenty-first century's undead were strictly Human. There was no reason anyone would want to build a zombie snake. This had to be another contamination artifact; some accidental genetic hack that shut down the MS receptor sites, maybe triggered a rogue suite of motor commands. Had to be.

Still.

He'd really hoped the ghosts would be easier to handle out here.

There weren't nearly as many ghosts in the desert, for one thing. For another, none of them were human. Sometimes he wished he could feel half as much for the thousands of *people*

he'd killed.

Of course, basic biology explained that particular double standard as well. He hadn't had to face any of his human victims, hadn't looked into their eyes, hadn't been there when they'd died. The gut was not a long-range organ. Its grasp of culpability degraded exponentially with distance; there'd been so many arcane degrees separating the actions of Daniel Brüks from their consequences that conscience itself entered the realm of pure theory. Besides, he'd hardly acted alone; the guilt diffused across the whole team. And their intentions, at least, had been beyond reproach.

Nobody had blamed them, not out loud, not really. Not at first. You don't pass judgment on the unwitting hammer used to bash in someone's skull. Brüks's work had been perverted by others intent on bloodshed; the guilt was theirs, not his. But those perpetrators remained uncaught and unpunished, and so many had needed closure in the meantime. And the distance between *How could they* and *How could you let them* was so much smaller than Brüks had ever imagined.

No charges had been pressed. It wasn't even enough to revoke his tenure. As it turned out, it was only enough to wear out his welcome on campus.

Nature, though. Nature always welcomed him. She passed no judgments, didn't care about right or wrong, guilt or innocence. She only cared about what worked and what didn't. She welcomed everyone with the same egalitarian indifference. You just had to play by her rules, and expect no mercy if things didn't go your way.

And so Dan Brüks had put in for sabbatical and filed his agenda, and headed into the field. He'd left behind his sampling drones and artificial insects, packed no autonomous tech to rub his nose in the obsolescence of human labor. A few had watched him go, with relief; others kept their eyes on the sky. He left them, too. His colleagues would forgive him, or they wouldn't. The aliens would return, or they wouldn't. But Nature would never turn him away. And even in a world where every last sliver of natural habitat was under siege, there was no

shortage of deserts. They'd been growing like slow cancer for a hundred years or more.

Daniel Brüks would go into the welcoming desert, and kill whatever he found there.

He opened his eyes to the soft red glow of panicking machinery. A third of the network had just died in his sleep. Five more traps went down as he watched: a booster station, suddenly offlined. Twenty-two beeped plaintively a moment later—proximate heat trace, big, man-size even—and dropped off the map.

Instantly awake, Brüks played the logs. The network was going down from west to east, each dead node another footfall in a growing trail of dark ragged footprints stomping across the valley.

Heading directly for him.

He pulled up the satcam thermals. The remains of the old 380 ran like a thin vein along the northern perimeter, yesterday's stale sunshine seeping from cracked asphalt. Diaphanous thermals and microclimatic hot spots, dying since nightfall, flickered at the threshold of visibility. Nothing else but the yellow nimbus of his own tent at center stage.

Twenty-one reported sudden warmth, and disappeared.

Cameras lurked here and there along the traplines. Brüks had never found much use for them but they'd come bundled as part of the package. One sat on a booster that happened to be line of sight to number nineteen. He brought it up: StarlAmp painted the nighttime desert in blues and whites, a surrealistic moonscape full of contrast. Brüks panned the view—

—and almost missed it: a slither of motion from stage right, an amplified blur. Something that moved faster than anything Human had any right to. The camera was dead before Nineteen even felt the heat.

The booster went down. Another dozen feeds died in an instant. Brüks barely noticed. He was staring at that last frozen frame, feeling his gut clench and his bowels turn to ice.

Faster than a man, and so much less. And just a little bit *colder* inside.

The field sensors weren't sensitive enough to register that difference, of course. To see the truth from heat signatures alone you'd need to look inside the very head of your target, to squint until you could see deltas of maybe a tenth of a degree. You'd look at the hippocampus, and see that it was dark. You'd listen to the prefrontal cortex, and hear that it was silent. And then maybe you'd notice all that extra wiring, the force-grown neural lattices connecting midbrain to motor strip, the high-speed expressways bypassing the anterior cingulate gyrus—and those extra ganglia clinging like tumors to the visual pathways, fishing endlessly for the telltale neural signatures of *seek* and *destroy*.

It would be a lot easier to spot those differences in visible light: Just look into the eyes, and see nothing at all looking back. Of course, if it ever got that close you'd be dead already. It wouldn't leave you time to beg. It wouldn't even understand your pleas. It would simply kill you, if that's what it had been told to do, more efficiently than any conscious being because there was nothing left to get in the way: no second thoughts, no pulled punches, not even the basic glucose-sucking awareness of its own existence. It was stripped down to pure reptile, and it was *dedicated*.

Less than a kilometer away now.

Something inside Daniel Brüks split down the middle. One half clamped its hands over its ears and denied everything—*what the fuck why would anyone must be some kind of mistake*—but the other remembered the universal human fondness for scapegoats, the thousands who'd died thanks to dumb ol' Backdoor Brüks, the odds that at least one of those victims might have been survived by next of kin with the resources to set a military-grade zombie on his trail.

How could they.

How could you let them...

The ATB hissed beneath him as its tires inhaled. The charge cord pulled him briefly off balance before tearing free. He

plunged through a gap in the trees and down the scree, skidding sideways: hit the base of the slope and the desert spun around him, slimy and frictionless. The stream nearly took him out right there. Brüks fought for control as the bike one-eightied, but those marvelous marshmallow tires kept him miraculously upright. Then he was racing east across the fractured valley floor.

Sagebrush tore at him as he passed. He cursed his own blindness; these days, no self-respecting grad student would be caught dead in the field without rattlesnake receptors in their eyes. But Brüks was an old man, baseline, night-blind. He didn't even dare use the headlamp. So he hurtled through the night, smashing through petrified shrubs, bucking over unseen outcroppings of bedrock. He fumbled one-handed through the bike's saddlebags, came up with the gogs, slapped them over his eyes. The desert sprang into view, green and grainy.

0247, the goggles told him from the corner of his eye. Three hours to sunrise. He tried pinging his network but if any part of it remained alive, it was out of range. He wondered if the zombie had made it to camp yet. He wondered how close it had come to catching him.

Doesn't matter. Can't catch me now, motherfucker. Not on foot. Not even undead. You can kiss my ass good-bye.

Then he checked the charge gauge and his stomach dropped away all over again.

Cloudy skies. An old battery, a year past its best-before. A charging blanket that hadn't been cleaned in a month.

The ATB had ten kilometers in it. Fifteen, tops.

He braked and brought it around in a spray of dirt. His own trail extended behind him, an unmistakable line of intermittent carnage wrought upon the desert floor: broken plants, sun-cracked tiles of ancient lakebed crushed in passing. He was running but he wasn't hiding. As long as he stayed on the valley floor, they'd be able to track him.

Who, exactly?

He switched from StarlAmp to infrared, zoomed the view.

That.

A hot tiny spark leapt against a distant slope, right about where his camp would be.

Closer, though. And closing fast. That thing could *run*.

Brüks swung the bike around and kicked it back into gear. He almost didn't notice the second spark sweeping across his field of vision, it was so faint.

He saw the third clearly enough, though. And the fourth. Too distant to make out shapes on thermal, but all hot as humans. All closing.

Five, six, seven...

Shit.

They were fanned out along the valley as far as he could see.

What did I do, what did I do, don't they know it was an accident? It wasn't even me, for chrissakes, I didn't kill anyone, I just—left the door open...

Ten kilometers. Then they'd be on him like ravenous wolves.

The ATB leapt forward. Brüks pinged 911: nothing. ConSensus was live enough but deaf to his pleas; somehow he could surf but not send. And his pursuers *still* weren't showing up on satellite thermal; as far as the skeyes could see he was alone down here with the microweather and the monastery.

The monastery.

They'd be online. They'd be able to help. At the very least the Bicamerals lived behind *walls*. Anything was better than fleeing naked through the desert.

He aimed for the tornado. It writhed in his enhanced sight, a distant green monster nailed to the earth. Its roar carried across the desert as it always did, faint but omnipresent. For a moment, Brüks heard something strange in that sound. The monastery resolved in the gogs, huddling in the shadow of the great engine. A myriad of pinpoint stars burned there against a low jumble of stepped terraces, almost painfully bright.

Three in the morning, and every window was ablaze.

Not so faint anymore: the vortex roared like an ocean now, its volume rising imperceptibly with each turn of the wheels. It was no longer stuck to the horizon. StarlAmp turned it into a pillar of fire, big enough to hold up the sky or to tear it down.

Brüks craned his neck: over a kilometer away and still the funnel seemed to lean over him. Any second now it would break free. Any second it would leap from the ground and slam back down, *there* or *there* or *right fucking here* like the finger of some angry god, and it would rip the world apart wherever it touched.

He stayed on course even though the monster ahead couldn't possibly be made of air and moisture, couldn't possibly be anything so—so *soft*. It was something else entirely, some insane Old Testament event horizon that chewed up the very laws of physics. It caught the glow from the monastery, trapped that light and shredded it and spun it together with everything else that fell within reach. A small gibbering thing inside Daniel Brüks begged him to turn back, *knew* that the creatures stalking him couldn't be worse than this, because whatever they were, they were only the size of men but this, *this* was the very wrath of God.

But that hesitant little voice spoke again, and this time the question lingered: *Why is this thing running so hard?*

It shouldn't have been. Vortex engines never really *stopped*, but at night they weakened in the cooling air, diffused and idled until the rising sun brought them back to full strength. To keep a funnel this size running so hot, so late at night—that would almost draw more energy than it yielded. The vapor from the cooling cells would have to be verging on live steam—and now Brüks was close enough to hear something *else* against the jet-engine roar, a faint creaking counterpoint of great metal blades, twisting past their normative specs...

The monastery lights went out.

It took a moment for his goggles to amp back up; but in that moment of pure, illuminating darkness Daniel Brüks finally saw himself for the fool he was. For the first time he saw the pinpoint heatprints *ahead* of him, closing from the east as well as from behind. He saw forces powerful enough to hack surveillance satellites in geostationary orbit, but somehow unable to blind his antique Telonics network to the same heatprints. He saw a military automaton, ruthless as a shark,

fast as a superconductor, betraying its own approach from kilometers away when it could have avoided his traplines entirely and killed him in his sleep.

He saw himself from high overhead, stumbling across someone else's game board: caught in a net that closed around but not *on* him.

They didn't even know I was here. They're after the Bicamerals.

He pulled to a stop. The monastery loomed fifty meters ahead, low and black against the stars. All windows abruptly shuttered, all approaches suddenly dark, it rose from the landscape as though born of it: a pile of deep rock strata breaching the surface of the world. The tornado loomed beyond like a whirling gash in space-time, barely a hundred meters on the other side. The sound of its rage filled the world.

On all sides, candles closed in the darkness.

0313, his goggles reminded him. Less than an hour ago he'd been asleep. It wasn't nearly long enough to come to terms with your own imminent death.

YOU ARE IN DANGER, the gogs told him helpfully.

Brüks blinked. The little red letters persisted, hovering off at the corner of his eye where the chrono readout should be.

COME ON, THEN. DOOR'S OPEN.

He looked past the command line, panned across the darkened façades of the monastery. There, ground level: just to the left of a broad staircase that underscored the main entrance. An opening, barely big enough for a man. Something burned there at body temperature. It had arms and legs. It waved.

MOVE YOUR ASS, BRÜKS, YOU SELF-ABSORBED IDIOT.

SEALING ENTRANCE IN 15s

14s

13s . . .

Brüks moved his self-absorbed idiot ass.

FOR THEY HAVE SOWN THE WIND, AND THEY SHALL
REAP THE WHIRLWIND.

—HOSEA 8:7

INSIDE, THE DARKNESS was bright chaos.

Human heat signatures flickered across Brüks's goggles at point-blank range, coruscations of false color in frantic motion. The heat of their passing painted the surroundings with fainter washes of red and yellow: rough-hewn walls, a flat dead light panel for a ceiling, a floor that yielded unexpectedly beneath his feet like some ungodly hybrid of rubber and flesh. Off in an indeterminate distance, something stuttered and wailed; here in the hallway the human rainbows moved with silent urgency. The woman who'd invited him in—a petite writhing heatprint no more than 160 centimeters tall—grabbed his hand and pulled him forward: "I'm Lianna. Stay close."

He followed, switching the gogs to StarlAmp. The heatprints vanished; bright greenish stars moved in the void left behind, always in pairs, binary constellations jostling and blinking in the dark. A word popped into his head: *luciferin*. Photophores in the retinas.

These people had eyes that doubled as flashlights. Brüks had once known a grad student with similar augments. Sex had been—disquieting, in the dark.

His guide threaded him through the starfield. That distant wailing rose and fell, rose and fell; not words exactly, but syllables, at least. Clicks and cries and diphthongs in the dark. Bright eyes rose before him, seething with cold blue light. Amplified photons limned a gray face full of lines and angles. Brüks tried to steer his way around but that face blocked his way, eyes glowing with such furious intensity that his goggles had to dial back the amplification to almost nothing.

"*Gelan*," the face croaked. "*Thofe tessrodia*."

Brüks tried to take a step back; bumped into traffic, rebounded.

"*Eptroph!*" cried the face, as the body beneath gave way.

Lianna pushed him sideways into the wall—"Stay *right there*"—and dropped to the floor. Brüks switched back to thermal. The rainbows returned. Brüks's assailant was on his back, heat sig bright as a solar flare, muttering nonsense. His fingers fluttered as if stabbing an invisible keyboard; his left foot tapped an agitated tattoo against the elastic flooring. Lianna cradled his head in her lap and spoke to him in the same incomprehensible tongue.

The chronic background roar of the vortex engine rose subtly in pitch. Stone trembled at Brüks's back.

A hot bright figure appeared down the corridor, swimming against the stream. Within moments it had reached them; Brüks's guide passed her charge to the newcomer and was on her feet in an instant. "Let's go."

"What was—"

"Not here."

A side door. A flight of stairs, sheathed in the same rubbery skin that turned their footsteps into soft squeaks. It corkscrewed down through cooling bedrock that dimmed with each step in the goggles' sights, but that compact body glowed like a beacon ahead of him. Suddenly the world was silent again but for their own footsteps and the distant, almost subsonic thrumming of the vortex engine.

"What's going on?" Brüks asked.

"Oh. Mahmood." Lianna glanced back, her eyes bright garish blobs, her mouth a crimson slash of heat. "Can't always control when the rapture hits, much less which node. Not the most convenient thing in the world but you don't want to miss the insights, you know? Could be time travel, for all we know. Could be a cure for golem."

"You understood what he was saying."

"Kinda. It's what I do, when I'm not bringing lost sheep in from the desert."

"You're a synthesist?" *Jargonaut* was the street name. Glorified translators, charged with bringing esoteric transhuman tablets down from the mountain, carved in runes simple enough for pitiful baseline Humans to half understand.

Rhona had called them *Moses mammals*, back when she'd been in the world.

But Lianna was shaking her head. "Not exactly. More of a—you're a biologist, right? Synthesists would be rats. I'm more of a koala bear."

"Specialist." Brüks nodded. "Narrower niche."

"Exactly."

A faint orange stain appeared on the thermoptics: warmth from below.

"And you know who I am because..."

"We're on the bleeding edge of theistic virology here. You think we don't know how to access a public database?"

"I just thought you'd have better things to look up when you were being attacked by zombies."

"We keep an eye on the neighborhood, Dr. Brüks."

"Yeah, but what—"

She stopped. Brüks nearly ran into her, then realized they'd reached the bottom of the stairs. Bright heat spilled around a corner dead ahead; Lianna turned and tapped his goggles. "You won't be needing those."

He pushed them onto his forehead. The world reverted to a dim wash of blues and grays. The rough stone to his left broke the feeble ambient light into jagged fragments; to his right the wall was smooth gray metal.

Lianna was already past him, heading back up the stairs. "I gotta go. You can watch from down here."

"But—"

"Don't touch anything!" she called back, and was gone.

He stepped around the corner. The ceiling panels here were as dead and dark as every other he'd seen in this place. The room—really, more of a cul-de-sac—was lit solely by a band of smart paint covering the far wall from waist-height to ceiling. It glowed with a haphazard collage of tactical displays ranging from hand-size to two meters across. Some of the feeds were coarse green mosaics; others rendered images high rez and razor-sharp.

A man in a loose tan coverall paced back and forth before the

displays, at least two meters from his fuzzy slippers (*slippers?*) to the cropped salt-and-pepper thicket on his head. He spared a glance as Brüks approached, muttered “Glas-*not*,” and turned back to the welter of intel.

Great.

Lianna the koala had told him he could watch, though. He stepped forward and tried to make sense of the chaos.

Upper left: a satellite view so crisp it nearly hurt his eyes. The monastery sat dead center, a bull’s-eye on the board, aglow with telltale thermal emissions. But it was the only hot spot in the whole window; whatever orbital eye he was looking through had been precisely blinded to all those other heatprints closing in the darkness. Brüks reached for the display, his fingers set to zoom the mag; a grunt and a glare from the slipped monk and he desisted.

So much for orbital surveillance. The monastery had its own cameras, though, judging by the mix of StarlAmp and thermal windows looking out across the desert. They painted the nightscape in palettes from every band of the visible spectrum, cool blues and rubies intense as lasers, color schemes so chaotic Brüks wondered whether they were really functional or just a reflection of some deviant Bicameral aesthetic. Candles glowed in each of *those* windows, and they all looked the same.

Four clicks out, and closing fast.

Something sparkled on one of the displays, a tiny bright sundog in the dead of night. The image flared a moment; bright electronic snow fuzzed the display. A brief, bright nova. Then a dark dead hole in the wall, NO SIGNAL flashing from its center.

The monk’s fingers flew across the paint, calling up keyboards, zooming displays. Windows sprouted, panned brief landscapes, evaporated in turn. Three of those views sparked and died before the Bicameral had the chance to retire them gracefully.

They’re taking out our cameras, Brüks realized, and wondered distantly when he had started to think of these rapture-stricken deviants as part of *we*.

Less than three and a half kilometers now.

A new set of windows bloomed across the wall. The pictures flickering in these frames were grainier than the others, desaturated, almost monochrome. And while they, too, panned the desert, there was something about those views, something different yet familiar—

There. Third window over: a tiny monastery hunkered on the horizon, a tiny vortex engine. *This* camera was looking back from way the hell across the desert.

That's my network, Brüks realized. *My cameras. I guess the zombies left some alive after all...*

Brother Slippers had tapped into a half dozen of them, zoomed and cycled through each in turn. Brüks wasn't sure how useful they'd be: cheap off-the-shelf things, party favors to lure impoverished researchers into springing for a package deal. They had the usual enhancements but the range was nothing special.

They seemed to be sufficient for Slippers's purposes, though. Second window from the left, a heat source moved left to right about a hundred meters out. The camera panned automatically, tracking the target while he amped the zoom. The image resolved in slow degrees.

Another one of the monastery's eyes flared and died, its overlaid range finder fading a moment later: 3.2 kilometers.

That's almost nine meters per second. On foot...

"What happens when they get here?" he asked.

Slippers seemed more interested in a distant heatprint caught on number three: a small vehicle, an ATB, same basic design as

Wait a minute—

"That's my bike," Brüks murmured, frowning. "That's—*me...*"

Slippers spared him a glance and a head shake. "Assub."

"No, *listen—*" It was far from a perfect mug shot, and Telonics's steadicam tracking algorithms were the envy of no one in the field. But whoever sat astride that bike had Brüks's mustache, the square lines of his face, the same multipocketed field vest that had been years out of style even when he'd inherited the damn thing two decades before. "You're being

hacked,” Brüks insisted. “That’s some kind of recording, someone must’ve—” *Someone was recording me?* “I mean, *look* at it!”

Two more cameras down. Seven so far. Slippers wasn’t even bothering to clear the real estate by closing the channels. Something else had caught his eye. He tapped the edge of a window that looked onto a naked-eye view of the desert sky. The stars strewn across that display glittered like sugar on velvet. Brüks wanted to fall into that sky, get lost in the stark peaceful beauty of a night without tactical overlays or polarized enhancements.

But even here, the monk had found something to ruin the view: a brief flicker, a dim red nimbus framing an oval patch of starscape for the blink of an eye. The display clicked softly, an infinitesimal sharpening of focus—and in the next instant the stars returned, unsullied and pristine.

Except for a great *hole* in the night hanging over the western ridge, a vast dark oval where no stars shone.

Something was crawling toward them across the sky, eating the stars as it went. It was as cold as the stratosphere—at least, it didn’t show up on any of the adjacent thermal views. And it was *huge*; it covered a good twenty degrees of arc even though it was still—

No range finder. No heatprint. If not for whatever microlensing magic Slippers had just performed, not even this eclipse of ancient starlight would have given it away.

I, Brüks realized, have definitely picked the wrong side.

Twenty-three hundred meters. In five minutes the zombies would be knocking at the door.

“Carousel,” Slippers murmured, and something in his voice made Brüks look twice.

The monk was *smiling*. But he wasn’t looking at the cloaked behemoth marching across Orion’s Belt. His eyes were on a ground’s-eye view of the vortex engine. There was no audio feed; the tornado whirled silently in the StarLamped window, a shackled green monster tearing up airspace. Brüks could hear it anyway—roaring in his memory, bending the ducts and the

blades of the substructure that birthed it, vibrating through the very bedrock. He could *feel* it in the soles of his feet. And now Brother Slippers brought up a whole new window, a panel not of camera views or tactical overlays but of engineering readouts, laminar feed and humidity injection rates, measures of torque and velocity and compressible flow arrayed along five hundred meters of altitude. Offset to one side a luminous wire-frame disk labeled VEC/PRIME sprouted a thousand icons around its perimeter; a hundred more described spokes and spirals toward its heart. Heating elements. Countercurrent exchangers. The devil's own mixing board. Slippers nodded, as if to himself: "Watch."

Icons and outputs began to move. There was nothing dramatic in the readouts, no sudden acceleration into red zones, no alarms. Just the slightest tweak of injection rates on one side of the circle; the gentlest nuzzle of convection and condensation on the other.

Over in its window, the green monster raised one toe.

Holy shit. They're going to set it free...

A wash of readouts turned yellow; in the heart of that sudden sunny bloom, a dozen others turned orange. A couple turned red.

With ponderous, implacable majesty, the tornado lifted from the earth and stepped out across the desert.

It came down on two of the zombies. Brüks saw it all through a window that tracked the funnel's movements across the landscape: saw the targets break and weave far faster than merely human legs could carry a body. They zigzagged, a drunkard's sprint by undead Olympians.

They might as well have been rooted to the ground. The tornado sucked those insignificant smudges of body heat into the sky so fast they didn't even leave an afterimage. It hesitated for a few seconds, rooted through the earth like some great elephant's trunk. It devoured dirt and gravel and boulders the size of automobiles. Then it was off, carving its name into the

desert.

Back in its garage, swirls of moisture condensed anew where the monster had broken free.

The vortex was past the undead perimeter now, veering northwest. It hopped once more, lifting its great earth-shattering foot into the air; pieces of pulverized desert rained down in its wake. A distant, disconnected subroutine in Brüks's mind—some ganglion of logic immune to awe or fear or intimidation—wondered at the questionable efficiency of throwing an entire weather system at two lousy foot soldiers, at the infinitesimal odds of even *hitting* a target on such a wild trajectory. But it fell silent in the next second, and didn't speak again.

The whirlwind was not staggering randomly into that good night. It was bearing down on a distant figure riding an ATB.

It was coming for *him*.

This isn't possible, Brüks thought. *You can't steer a tornado, nobody can. The most you can do is let it loose and get out of the way. This isn't happening. This isn't happening.*

I am not out there...

But something was, and it knew it was being hunted. Brüks's own hacked cameras told the tale: the ATB had abandoned its straight-line trajectory in favor of breakneck evasive maneuvers that would have instantly pitched any human rider over the handlebars. It slewed and skidded, kicked up plumes that sparkled sapphire in the amped starlight. The vortex weaved closer. They swept across the desert like partners in some wild and calamitous dance full of twirls and arabesques and impossible hairpin turns. They were never in step. Neither followed the other's lead. And yet some invisible, unbreakable thread seemed to join the two, pulled them implacably into each other's arms. Brüks watched, hypnotized at the sight of his own imminent ascension; the ATB was caught in orbit now around its monstrous nemesis. For a moment Brüks thought it might even break free—was it his imagination, or was the funnel *thinner* than it had been?—but in the next his doppelgänger lost its footing and skidded toward dissolution.

In that instant it *changed*.

Brüks wasn't certain how, exactly. It would have happened too fast even if whirling debris and the grain of boosted photons hadn't obscured the view. But it was as though the image of Daniel Brüks and his faithful steed *split* somehow, as if something inside was trying to shed its skin and break free, leaving a lizard-tail husk behind for the sky-beast to chew on. The maelstrom moved in, a blizzard of rock and dust obscuring any detail. The funnel was visibly weakening now but it still had enough suction to take its quarry whole.

Still had teeth enough to smash it to fragments.

The undead broke ranks.

It wasn't a retreat. It didn't even seem to be a coordinated exercise. The candles just stopped advancing and *flickered* back and forth in their windows, nine hundred meters out, directionless and Brownian. Far behind them the sated whirlwind weaved away to the north, a dissipating ropy thing, nearly exhausted.

"Dymic." Slippers nodded knowingly. "Assub."

Back on the pad a newborn vortex chafed at its restraints, smaller than its predecessor but *angrier*, somehow. Yellow icons blossomed across VEC/PRIME like rampant brush fires. Overhead, something was eating Gemini feetfirst.

Another window opened on the wall, a hodgepodge of emerald alphanumerics. Slippers blinked and frowned, as though the apparition was somehow unexpected. Greek equations, Cyrillic footnotes, even a smattering of English flowed across the new display.

Not telemetry. Not incoming. According to the status bar, this was an outgoing transmission; the Bicamerals were signaling someone. It all flickered by too fast for Brüks to have made much sense of it even if he *had* spoken Russian, but occasional fragments of English stuck in his eye. *Theseus* was one. *Icarus* another. Something about *angels* and *asteroids* flashed center stage for a moment and evaporated.

More glyphs, more numbers: three parallel columns this time, rendered in red. Someone talking back.

Out in the desert, the zombies stopped flickering.

“Huh,” Slippers said, and raised a finger to his right temple. For the first time Brüks noticed an old-fashioned earbud there, an audio antique from the days before cortical inlays and bone conduction. Slippers inclined his head, listening; up on the wall a flurry of red and green turned the ongoing exchange into a Christmas celebration.

Over on VEC/PRIME, orange and red icons downshifted to yellow. The chained vortex stopped thrashing on its pad and whirled smoothly at attention. Halfway to the horizon, the last vestiges of its older sibling dissipated in a luminous mist of settling dust.

The desert rested quietly beneath an invisible thing in the sky.

Just a few minutes ago, Dan Brüks had watched himself die out there. Or maybe escape in the nick of time. Something like him, anyway. Right up until that last moment when the maelstrom had chewed it up and spat it out. And right at that moment, the zombies had come—unglued...

Assub, Slippers had said then. At least, that’s what Brüks had heard. *Assub*.

Ass—hub?

“A.S.?” he said aloud. Brother Slippers turned, raised an eyebrow.

“A.S.,” Brüks repeated. “What’s it stand for?”

“Artificial Stupidity. Grabs local surveillance archives to blend in. Chameleon response.”

“But why me? Why”—in the sky, invisible airships—“why *anything*? Why not just cloak, like that thing up there?”

“Can’t cloak thermal emissions without overheating,” Slippers told him. “Not for long at least, not if you’re an endotherm. Best you can do is make yourself look like something else. Dynamic mimicry.”

Dymic.

Brüks snorted, shook his head. “You’re not even Bicameral, are you?”

Slippers smiled faintly. “You thought I was?”

"It's a monastery. You spoke like..."

Slippers shook his head. "Just visiting."

Acronyms. "You're military," Brüks guessed.

"Something like that."

"Dan Brüks," he said, extending a hand.

The other man looked at it for a moment. Reached out his own. "Jim Moore. Welcome to the armistice."

"What just happened?"

"They came to terms. For the moment."

"They?"

"The monks and the vampire."

"I thought those were zombies."

"*Those* are." Moore tapped the wall; a heat source appeared in the distance, a lone bright pinprick well behind the line. "*That* isn't. Zombies don't do anything without someone pulling their strings. She's coming in now."

"Vampires," Brüks said.

"Vampire. Solitary op." And then, almost as an afterthought, "Those things aren't good in groups."

"I didn't even know we let them out. I actually thought we were pretty scrupulous about keeping them, you know. Contained."

"So did I." Pale flickering light washed the color from Moore's face. "Not quite sure what her story is."

"What's she have against the Bicamerals?"

"I don't know."

"Why did she stop?"

"Enemy of my enemy."

Brüks let that sink in. "You're saying there's a *bigger* enemy out there. A, a common threat."

"Potentially."

Out in the desert, that dimensionless point of heat had grown large enough to move on visible legs. It did not appear to be running, yet somehow crossed the desert far faster than any baseline was likely to walk.

"So I guess I can go now," Brüks said.

The old soldier turned to face him. Regret mingled with the

tactical reflections in his eyes.

“Not a chance,” he said.

EITHER WAR IS OBSOLETE, OR MEN ARE.

—R. BUCKMINSTER FULLER

TWO GUARDS STOOD at the door halfway down the hall, one to each side, like a couple of dark golems in matching pajamas. Brüks had not been invited to the party inside but he followed Moore at a distance, hanging back along the edge of the corridor for want of any other destination. Bicamerals brushed past in both directions, going about whatever business involved the domestication of weaponized whirlwinds. They seemed unremarkable in the morning light slanting through the windows. No arcane ululations. No vestments or hooded robes, no uniforms of any kind that Brüks could make out. A couple wore denim. One, preoccupied with a tacpad as he passed, was stark naked except for the tattoo squirming along his chest: some kind of winged animal Brüks was pretty sure didn't exist anywhere in the taxonomic database.

They still had stars in their eyes, though.

Ahead, Moore stepped between the guards and into the room. Brüks sidled up in his wake. The sentries stood still as stone, barefoot, faces forward, their beige coveralls identically featureless. Empty holsters hung from their belts.

Their lightless eyes wouldn't stop moving. They jiggled and jerked in panicked little arcs, back and forth, up and down, as though terrified souls had been buried alive in wet cement. Someone coughed softly down the hall. All four eyes locked on that sound for the merest instant, froze in synchronized quadrascopic far focus: then broke, and resumed struggling in their sockets.

There was a market niche for zombies, Brüks had read, among those who still took their sex in the first person. He tried

to imagine fucking any creature possessed of such eyes, and shuddered.

He passed by on the far side of the hall. Parallax served up a moving slice of the room behind the door: Jim Moore, a tabletop holo display in standby mode, a handful of Bicamerals nodding among themselves. A woman: lean as a greyhound beneath a mimetic body stocking, a bone-pale face under a spiky shock of short black hair, jawline just a bit more prognathous than any card-carrying prey might feel comfortable with. She turned her head as Brüks crept by. Her eyes flashed like a cat's. She bared her teeth. On anyone else it would have been a smile.

The door swung shut.

"Hey. Hungry?"

He jumped at the hand on his arm but it was only a woman, dreadlocked and gracile and with a smile that warmed his skin instead of freezing it. Her skin was uniform chocolate, not the rainbow swirl of false color it had been the night before; but he recognized the voice.

"Lianna." He grunted, taking her in. "You're the first person I've seen here who's actually dressed like a monk."

"It's a bathrobe. We're not really into gang colors around here." She jerked her chin down the hall. "C'mon. Breakfast."

They selected their meals from a commons that looked reassuringly like a conventional cafeteria bar (cloned bacon, Brüks was relieved to see; he'd been afraid the Bicamerals would be vegan traditionalists), but they ate sitting on the sprawling steps of the main entrance, watching the morning shadows shorten by degrees across the desert. The quiet hiss of an idling tornado drifted over the ramparts behind them.

"That was quite the night," Brüks said around a mouthful of egg.

"Quite the morning, too."

He raised his eyes. Far overhead, the contrail of some passing airbus etched a line across the sky.

“Oh, it’s still up there,” Lianna remarked. “Kinda flickers in and out of the higher wavelengths if you stare hard enough.”

“I can’t see it.”

“What kind of augments you got?”

“For my eyes? Nothing.” Brüks dropped his gaze back to the horizon. “Got wired with cryptochrome back when it was the Next Big Thing, thought it would help me find my way around down in Costa Rica. You know the ads, *never be lost again*. Except suddenly I wasn’t just seeing Earth’s magnetic field, I was seeing a halo around every bloody tacpad and charge mat. It was distracting as hell.”

Lianna nodded. “Well, it takes some getting used to. Give sight to the blind, takes time to learn how to see.”

“More than I had the patience for. Pigment’s still sitting back there in my retina but I got it blocked after about a week.”

“Wow. You’re old school.”

He fought back a twitch of irritation: *Half my age, and she’s probably already forgotten the difference between the meat she was born with and the chrome that came after*. “I’ve got the usual brain boosts. Can’t very well get tenure otherwise.” *Which reminds me*—“I don’t suppose there’s any Cognital on the premises? I left mine back at camp.”

Lianna’s eyes widened. “You take *pills*?”

“It’s the same—”

“It’d take about ten minutes to fit you with a pump and you take *pills*.” Her face split into a big goofy grin. “That’s not old school, that’s downright *Paleolithic*.”

“Glad you find it so fucking amusing, Lianna. You have the pills or not?”

“Not.” She pursed her lips. “I guess we could synthesize some. I’ll ask. Or you might ask Jim. He’s, well...”

“Old school,” Brüks finished.

“Actually, you’d be surprised how much wiring he’s got in his head.”

“I’m surprised to even find him here. Military man in a monastery?”

“Yeah, well, you were expecting us all to wear bathrobes.”

“He’s here to help you in your war against the vamps?” Brüks set his empty plate beside him on the step.

She shook her head. “He’s here to—he just needed a place to work through some stuff. Also I think he’s kinda spying on us.” She cocked her head at him: “What about you?”

“I got herded,” he reminded her.

“No, I mean, what were you even doing out in the field? There any species even left out there that haven’t been RAMrodded and digitized?”

“The extinct ones,” Brüks said shortly. Then, relenting: “Sure, you can virtualize anything in the lab. Still doesn’t tell you what it’s doing out in the wide wet world with a million unpredictable variables working on it.”

She looked out across the flats. Brüks followed her gaze. There, just off to the northwest: the ridge upon which his own home had crouched lo these past two months. He could not see it from here.

“You gonna tell me what’s going on?” he said at last.

“You got caught in the crossfire.”

“*What* crossfire? Why were the zombies—”

“The vampire,” Lianna said. “Valerie, actually.”

“You’re kidding.”

She shrugged.

“So Valerie the Vampire summons her zombie forces against the Bicamerals. And now they’re all sitting together just down the hall, munching chips and cocktail wienies because—Moore said something about a common enemy.”

“It’s complicated.”

“Try me.”

“You wouldn’t understand.” She tried for a smile—“You’re behind on your Cognital”—but it fell flat.

“Look, I’m sorry I crashed your party but—”

“Dan, the truth is *I* don’t really know a whole lot more than you do at this point.” She spread her hands. “All I can tell you for sure is, well, you gotta trust them. They know what they’re doing.”

She stopped just short of patting him on the head.

He stood. "Glad to hear it. Then I guess I'll leave you to your games, and thanks for the meal."

She looked up at him. "You know that can't happen. Jim already told you that much."

"Are you going to tell me where my bike is, or do I have to walk?"

"You can't leave, Dan."

"You can't keep me prisoner."

"It's not us you have to worry about."

"Who's us, this time? Bicamerals, vampires? Koalas?"

She pointed north across the desert, squinting. "Look out there. On that ridge."

He did. He saw nothing at first. Then, briefly, something glinted in the morning sun: a spark on the escarpment.

"Now look up," she said. A distant shard of brightness stabbed his eye from high to the east, a reflection of sunlight off empty sky.

"Not us," Lianna repeated. "You."

"Me—?"

"People like you. Baselines."

He let it sink in.

"Valerie must have hacked a fair number of sats just getting her pieces into position. As far as anything in orbit could tell, this whole chunk of desert just dropped out of existence for a good four hours last night. That got people's attention. Someone probably slipped a drone or two under the ceiling in time to see our engine going through its paces—and those dance steps are, shall we say, a bit beyond what passes for state-of-the-art out there." Lianna sighed. "The Bicamerals have been spooking the wrong people for years now. Too many breakthroughs, too fast, the usual. They've been watching, all this time they've been watching. And now, as far as they can tell, we're in some kind of gang war with a bunch of zombies."

"They are not going to let this pass, Dan. Now that they've caught a glimpse behind the curtain they'll have thrown a net over the whole reserve."

And I, Brüks reflected, don't blame them one goddamned bit.

"I'm not part of this. You said it yourself."

"You're a witness. They'll debrief you."

"So they'll debrief me." Brüks shrugged. "You haven't told me anything. I haven't seen anything they haven't, if they deployed drones."

"You've seen more than you realize. Everyone does. And they will know that, so your debriefing will be *aggressive*."

"So that makes you, what? My personal guard? Here to feed me, and walk me, and make sure I don't wander off into any of the rooms where the grown-ups are talking. And yank on my leash if I try to leave. That about sum it up?"

"Dan—"

"Look, you're giving me a choice between a vampire with her zombie army and *you baselines*, as you so delicately put it."

She got to her feet. "I'm not giving you a choice."

"I have to leave sometime. I can't spend the rest of my life here."

"If you try to leave now," she said, "that's exactly what you'll have done."

He looked down at her: thin as a pussy willow, she only came up to his chest.

"You going to stop me?"

She looked back without blinking. "I'm gonna try. If I have to. But I really hope it doesn't come to that."

He stood there for the longest time. Then he picked up his plate.

"Fuck you," he said, and went back inside.

Within his prison, she gave him all the space in the world. She backed right off as he stalked down the hall, past the murmuring of the devout and the hyperkinetic gaze of the frozen zombies, past the closed-door deliberations of enemies-of-enemies and the open doors of dorms and studies and bathrooms. He moved without direction at first, following any corridor that presented itself, backtracking from every cul-de-sac, his feet exploring autonomously while his gut churned.

After a while, some dull sullen pain behind his eyes brought him back to the here-and-now; he took more conscious note of his surroundings and decided to revisit Moore's basement watchtower, as much for its relative familiarity as for any tactical insights he might glean.

He couldn't find it. He remembered Lianna leading him through a hole in the wall; he remembered emerging from it after the armistice. It had to be off the main corridor, had to lie behind one of these identical oaken doors that lined the hall, but no perspective along that length seemed familiar. It was as though he was in some off-kilter mock-up of the place he'd been just an hour before, as though the layout of the monastery had changed subtly when he wasn't looking. He started trying doors at random.

The third was ajar. Low voices murmured behind it. It swung inward easily; flat panels of vat-cloned hardwood lined the space beyond, a kind of library or map room that looked out onto a grassy compound (half sunlit, half in shadow). Past sliding glass doorways, arcane objects rose haphazardly from that immaculate lawn. Brüks couldn't tell whether they were machines or sculptures or some half-assed hybrid of the two. The only thing that looked at all familiar out there was a shallow washbasin set atop a boxy waist-high pedestal.

There was one of those inside, too, just past a conference table that dominated the center of the room itself. Two mismatched Bicamerals stood at the table's edge, gazing at a collection of dice-size objects scattered across some kind of hard-copy map or antique game board. The Japanese monk was gaunt as a scarecrow; the Caucasian could have passed for Santa Claus at the departmental Christmas party, given the right threads and a pillow stuffed down his front.

"From Queensland, maybe," Santa remarked. "That place always bred the best neurotoxins."

The scarecrow scooped up a handful of objects (not dice, Brüks saw now; a collection of multifaceted lumps that made him think of mahogany macramé) and arranged them in a rough crescent across the board.

Santa considered. "Still not enough. Even if we *could* sift the Van Allens dry on short notice." He absently scratched the side of his neck, seemed to notice Brüks at last. "You're the refugee."

"Biologist."

"Welcome anyway." Santa smacked his lips. "I'm Lockett."

"Dan Brüks." He took the other man's nod for an invitation and stepped closer to the table. The pattern decorating the game board—a multicolored spiral of interlocking Penrose tiles—was far more complex than any he remembered from his grandfather's attic. It seemed to move at the corner of his eye, to crawl just so when he wasn't quite looking.

The scarecrow clicked his tongue, eyes never leaving the table.

"Don't mind Masashi," Lockett remarked. "He's not much for what you'd call normal conversation."

"Does *everyone* around here speak in tongues?"

"Speak—oh, I see what you mean." Lockett laughed softly. "No, with Masashi here it's more like a kind of aphasia. When he's not linked in, anyway."

The scarecrow spilled a few more mahogany knuckles with chaotic precision. Lockett laughed again, shook his head.

"He talks through board games," Brüks surmised.

"Close enough. Who knows? I might be doing the same thing by the time I graduate."

"You're not—?" Of course he wasn't. His eyes didn't sparkle.

"Not yet. Acolyte."

It was enough that he spoke English. "I'm trying to find the room I was in last night. Basement, spiral stairs, kind of a war room bunker feel to it?"

"Ah. The Colonel's lair. North hall, first right, second door on the left."

"Okay. Thanks."

"Not at all." Lockett turned away as Masashi clicked and rolled the bones. "More than enough antimatter to break orbit, anyway. Least it saves on chemical mass."

Brüks stopped, hand on the doorknob. "What was that?"

Lockett glanced back at him. "Just drawing up plans. Nothing

to worry about.”

“You guys have *antimatter*?”

“Before long.” Luckett grinned and dipped his hands into the washbasin. “God willing.”

Most of the tactical collage was dark, or writhing with analog static. A half-dozen windows flickered fitfully through random points of view: desert, desert, desert. No satcam imagery. Either Moore had shut down those feeds or whoever was behind the blockade had walled off the sky as well as the horizon.

Brüks tapped experimentally on an unlit patch of paint. His touch provoked a brief flicker of red, but nothing else.

The active windows kept changing, though. Some kind of motion sensor built into the feed, maybe: views would pan and pounce, flash-zooming on this flickering shadow or that distant escarpment. Sometimes Brüks couldn’t see anything noteworthy at the center of attention: a falcon grooming itself on a skeletal branch, or the burrow of a desert rodent halfway to the horizon. Once or twice a little fall of rock skittering down a distant slope, scree dislodged by some unseen disturbance.

Once, partially eclipsed by leaves and scrub, a pair of glassy reflections looking back.

“Help you?”

Jim Moore reached past Brüks’s shoulder and tapped the display. A new window sprang to life at his fingertip. Brüks stepped aside while the soldier stretched the window across the paint, called up a feed, zoomed on a crevice splitting a hillock to the south.

“I was trying to get online,” Brüks admitted. “See if anyone out there’s picked up on this whole—*quarantine* thing.”

“Net’s strictly local. I don’t think the Bicamerals actually have Quinternet access.”

“What, they’re afraid of getting hacked?” It was an ongoing trend, Brüks had heard: defensive self-partitioning in the face of Present Shock, and damn the legal consequences. People were starting to weigh costs against benefits, opt for a day or two

outside the panopticon even in the face of the inevitable fines and detentions.

But Moore was shaking his head. "I don't think they need it. Do *you* feel especially lost without access to the telegraph network?"

"What's a telegraph?"

"Exactly." Something caught the Colonel's eye. "Huh. That's not good."

Brüks followed the other man's gaze to the window he'd opened, to the crevice centered there. "I don't see anything."

Moore played a little arpeggio on the wall. The image blossomed into false color. Something glowed Euclidean yellow in all that fractal blue.

He grunted. "Aerosol delivery, looks like."

"Your guys?"

The corner of Moore's mouth curled the slightest bit. "Can't really say."

"What's to say? You're a soldier, right? They're soldiers, unless the government's started subcontracting to—"

"Biothermals, too. They're not trusting their bots to run things." There was a hint of amusement in the old soldier's voice. "Probably baselines, then."

"Why's that?"

"Fragile egos. Low self-esteem." His fingers skipped across the darkened wall. Bright windows flared everywhere they touched.

"At least you're all on the same side, then, right?"

"Doesn't really work like that."

"What's that supposed to mean?"

"The chain of command isn't what it used to be." Moore smiled faintly. "It's more—organic, these days. Anyway." Another finger dance; the window dwindled and slid to an empty spot along the edge of the wall. "They're still setting up. We've got time."

"How was the meeting?" Brüks asked.

"Still going on. Not much point hanging around after the opening ceremonies, though. I'd just slow them down."

“And let me guess: you can’t tell me what’s going on, and it’s none of my business anyway.”

“Why would you say that?”

“Lianna said—”

“Dr. Lutterodt wasn’t at the meeting,” Moore reminded him.

“Okay. So is there anything *you* can—”

“The Fireflies,” Moore said.

Brüks blinked. “What about—oh. Your common enemy.”

Moore nodded.

Memories of intercepted negotiations, scrolling past in Christmas colors: “*Theseus*. They found something out there?”

“Maybe. Nothing’s certain yet, just—hints and inferences. No solid intel.”

“Still.” An alien agency capable of simultaneously dropping sixty thousand surveillance probes into the atmosphere without warning. An agency that came and went in seconds, that caught the planet with its pants down and took God knew how many compromising pictures along God knew how many wavelengths before letting the atmosphere burn its own paparazzi down to a sprinkle of untraceable iron floating through the stratosphere. An agency never seen before and never since, for all the effort put into finding it. “I guess that qualifies as a common threat,” Brüks admitted.

“I guess it does.” Moore turned back to his war wall.

“Why were they fighting in the first place? What does a vampire have against a bunch of monks?”

Moore didn’t answer for a moment. Then: “It’s not personal, if that’s what you’re thinking.”

“What, then?”

Moore took a breath. “It’s—more of the same, really. Entropy, increasing. The Realists and their war on Heaven. The Nanohistomites over in Hokkaido. Islamabad on fire.”

Brüks blinked. “Islamabad’s—”

“Oops. Getting ahead of myself. Give it time.” The Colonel shrugged. “I’m not trying to be coy, Dr. Brüks. You’re already in the soup, so I’ll tell you what I can so long as it doesn’t endanger you further. But you’re going to have to take a lot on

—well, on faith.”

Brüks stifled a laugh. Moore looked at him.

“Sorry,” Brüks said. “It’s just, you hear so much about the Bicamerals and their scientific breakthroughs and their quest for Truth. And I finally get inside this grand edifice and all I hear is *Trust* and *God willing* and *Take it on faith*. I mean, the whole order’s supposed to be founded on the search for knowledge, and Rule Number One is *Don’t ask questions?*”

“It’s not that they don’t have answers,” Moore said after a moment. “It’s just that we can’t understand them for the most part. You could resort to analogies, I suppose. Force transhuman insights into human cookie-cutter shapes. But most of the time that would just get you a bleeding metaphor with all its bones broken.” He held up a hand, warding off Brüks’s rejoinder. “I know, I know: it can be frustrating as hell. But people have an unfortunate habit of assuming they understand the reality just because they understood the analogy. You dumb down brain surgery enough for a preschooler to think he understands it, the little tyke’s liable to grab a microwave scalpel and start cutting when no one’s looking.”

“And yet.” Brüks glanced at the wall, where AEROSOL DELIVERY glowed in shades of yellow and orange. Where a murderous tornado had rampaged the night before. “They seem to solve their conflicts pretty much the same way as us retarded ol’ baselines.”

Moore smiled faintly. “That they do.”

. . .

He found Lianna back on the front steps, supper balanced on her knees, watching the sun go down. She looked back over her shoulder as he pushed through the door.

“I asked about your brain-boosters,” she said. “No luck. The assembly line’s booked or something.”

“Thanks for trying,” he said.

“Jim might still be holding. If you haven’t asked him

already.”

He shifted his tray to one hand, used the other to rub away the vague pain behind his eyes. “Mind if I join you?”

She spared one hand to take in the staircase, as broad and excessive as a cathedral’s.

He sat beside her, picked at his own plate. “About this morning, I, uh...”

She stared at the horizon. The sun stared back, highlighting her cheekbones.

“...sorry,” he finished.

“Forget it. Nobody likes being in a cage.”

“Still. I shouldn’t have shot the messenger.” A sudden chilly breeze crawled across his shoulders.

Lianna shrugged. “You ask me, nobody should shoot anybody.”

He raised his eyes. Venus twinkled back at them. He wondered briefly if those photons had followed a straight line to his eyes, or if they’d been shunted around some invisible spillway of curves and angles at the last nanosecond. He looked around at the cracked desert floor, lifted his gaze to the more jagged topography in the distance. Wondered how many unseen agents were looking back.

“You always eat out here?”

“When I can.” The lowering sun stretched her shadow along the ramparts behind them, a giantess silhouetted in orange. “It’s —stark, you know?”

Ribbed clouds, a million shades of salmon, scudding against an orange and purple sky.

“How long does this go on?” he wondered.

“This?”

“They lurk out there, we wait in here. When does somebody actually make a move?”

“Oldschool, you gotta *relax*.” She shook her head, smiled a twilit smile. “You could obsess and second-guess for a solid month and I guarantee you wouldn’t be able to think of anything our hosts haven’t already factored five ways to Sunday. They’ve been making moves all day.”

“Such as?”

“Don’t ask me.” She shrugged. “I probably wouldn’t understand even if they told me. They’re wired up way differently.”

Hive mind, he reminded himself. Synesthetes, too, if he wasn’t mistaken.

“You *do* understand them, though,” he said. “That’s your job.”

“Not the way you think. And not without a fair bit of modding on my own.”

“How, then?”

“I’m not sure,” she admitted.

“Come on.”

“No, really. It’s a kind of Zen thing. Like playing the piano, or being a centipede in Heaven. The moment you start to think about what you’re doing, you screw up. You just have to get into the zone.”

“They must have trained you at some point,” Brüks insisted. “There must have been some kind of conscious learning curve.”

“You’d think so, wouldn’t you?” She squinted up at some invisible behemoth he still couldn’t see. “But they kind of—bypassed that. Zapped my fornix with just the right burst of ultrasound and next thing I know it’s four days later and I have all these reflexes. Not so much that I understand them as my *fingers* do, you know? Phonemes, rhythms, gestures—eye movements, sometimes—” She frowned. “I take in all these cues, and equations just—come to me, piece by piece. I copy them down and I send ’em off. And the next day they show up in the latest issue of *Science*.”

“You never examined these *reflexes* afterward? Played the piano really slowly, taken the time to watch what your fingers were doing?”

“Dan, they *won’t fit*. Consciousness is a scratchpad. You can store a grocery list, jot down a couple of phone numbers—but were you even aware of finishing your supper?”

Brüks looked down at his plate. It was empty.

“And that’s just a couple of swallows half a minute in the

past. You ever try holding, say, even a single chapter of a novel in your head? Consciously? All at once?" Her dreads swept back and forth in the gloom. "Whatever I'm doing, it's got too many variables. Won't fit in the global workspace." She flashed him a small, apologetic smile.

They program us like clockwork dolls, he thought. Way off to the west, the sun touched gently down on a distant ridge.

He looked at her. "Why are we still in charge?"

She grinned. "Who's *we*, white boy?"

He didn't. "These people you—work for. They're supposed to be *helpless*, that's what everyone says. You can optimize a brain for *down there* or *up here*, not both. Anyone comfortable thinking at Planck scales, they can barely cross the street unassisted up in the real world. That's why they set up in the desert. That's why they have people like you. That's what they tell us."

"All true, more or less," Lianna said.

He shook his head. "They *micromanage tornadoes*, Lee. They turn people into puppets with a wink and a wave, they own half the patent office. They're about as helpless as a T. rex in a daycare center. So why haven't they been running things for years?"

"That's like a chimp asking why those hairless apes aren't slinging bigger feces than everyone else, if they're so damned clever."

He tried not to smile, and failed. "That's not really an answer."

"Sure it is. Everybody goes on about *hive mind this* and *synesthesia that* like they were some kind of superpowers."

"After last night, you're going to tell me they're *not*?"

"It goes so much deeper than that. It's *perceptual*. We're so—impoverished, you know? We don't look out at reality at all, we look *in* at this model, this caricature our brains cobble together out of wavelengths and pressure points. We squint down over handwritten notes that say *two blocks east, turn left at the bridge* and we think that reading those stupid scribbles is the same as seeing the universe passing by on the other side of the

windshield.” She glanced over her shoulder, to the edifice at their backs.

Brüks frowned. “You think Bicamerals can see outside the windshield.”

“Dunno. Maybe.”

“Then I’ve got some bad news for you. Reality went out the window the moment we started mediating sensory input through a nervous system. You want to actually perceive the universe directly, without any stupid scribbles or model-building? Become a protozoan.”

A smile lit her face, startlingly bright in the deepening gloom. “Wouldn’t that be *just* like them. Build a group mind complex enough to put any hundred baseline geniuses to shame, and use it to think like a paramecium.”

“That wasn’t exactly my point,” he said.

The sun winked good-bye and slid below the horizon.

“I don’t know how they do it,” she admitted. “But if what they see is even *closer* to reality—well, that’s what you call transcendence. Not the ability to *micromanage tornados*, just—seeing a little more of what’s out *there*.” She tapped her temple. “Instead of what’s in *here*.”

She stood, stretched like a cat. Brüks rose beside her and brushed the desert from his clothes. “Then transcendence is out of reach. For our brains, anyway.”

Lianna shrugged. “Change your brain.”

“Then it’s not your brain anymore. It’s something else. *You’re* something else.”

“That’s kinda the point. Transcendence is transformation.”

He shook his head, unconvinced. “Sounds more like suicide to me.”

. . .

He felt his eyes start up under closed lids, stepped out onto that razor-thin line between dreamtime and the waking edge: just enough awareness to see the curtain, not enough to notice the

man behind.

Lucid dreaming was a delicate exercise.

He sat up on the pallet, phantom legs still wearing corporeal ones like the abdomen of some half-molted insect. He looked around at furnishings that would have been spartan to anyone who hadn't just spent two months sleeping on the desert floor: a raised sleeping pallet a couple of meters long, dipped in some softer, thicker variant of the fleshy synthetic lining the floors. An alcove in the wall, a medicine cabinet fronted with frosted glass. Another one of those washbasin pedestals, this one with a towel bar bolted to the side facing the bed: a hand towel draped over it. The cubby Lockett had tucked him into for the night, all pretty much the way it looked when he was awake.

He'd learned to launch his dreams from a platform anchored in reality. It made the return trip easier.

Brüks flexed his temporoparietal and ascended through a ceiling of polished granite (that was surmise—he'd forgotten to take note of its composition in the waking world). The monastery spread out around, then below him: dwindled from a life-size fortress to a tabletop model on a cracked gray moonscape. A fingernail moon shone bone-white overhead; everywhere else, a million stars glinted hard as ice crystals against the darkness.

He flew north.

It was minimalist magic: no rainbow bridges or talking clouds, no squadrons of aircraft piloted by tyrannosaurs. He'd long since learned not to strain the credulity of whatever mental processes indulged his presence here, critics that had lived in his head since before his dreams had even been lucid. Some inner skeptic frowned at the thought of a space-faring bicycle and dreaming eight-year-old Danny Brüks found himself stranded between the stars. Some forebrain killjoy snorted at the giddy delight of flying and suddenly he was entangled in high-tension wires, or simply ejected back into consciousness at three in the morning, spat out of sleep by his own incredulity. Even in dreams, his brain had been selling him out since before he'd had hair on his crotch. As an adult he'd had no use for

them until his limited baseline learning curve had run out of waking hours, forced him to learn new techniques in his sleep lest academia's new-and-improving generation devoured him from behind.

He could fly now at least, without thought or self-subversion. He'd learned that much through years of practice, through the induction hardware that had once guided his visions when REM started up, through the exercises that eventually let him ditch those training wheels and do it all in his own head. He could fly, into orbit and beyond and back if he wanted to. He could fly all the way to Heaven. That was where he was going now: the northern lights swirled in the sky directly ahead, a blue-green curtain shimmering above his destination like a star of Bethlehem for the Holographic Age.

But no talking clouds. He'd also learned not to push it.

Now, ghostlike, he passed through Heaven's fortifications and descended into its deepest levels. Rho languished there as she always did, alone in her cell, still wearing the paper smock and slippers she'd worn in Departures when they'd told each other it wasn't good-bye. A cuff around her left ankle and a dozen links of corroded chain shackled her to the wall. Hair hung across her downcast face like a dark curtain.

Her face lit up, though, as he descended through the ceiling.

He settled beside her on the stone floor. "I'm sorry. I would've come sooner, I just—"

He stopped. No point in wasting precious REM with dreamed apologies. He tweaked the script, started again.

"You wouldn't believe what's happening," he said.

"Tell me."

"I've got caught up in some kind of war, I'm trapped behind enemy lines with a bunch of—really. You wouldn't believe me."

"Monks and zombies," she said. "And a vampire."

Of course she knew.

"I don't even know how I can *be* here. You'd think with all this stuff happening I'd be too wired to even sit down, but—"

"You've been going straight for twenty-four hours." She laid her hand on his. "Of *course* you're going to crash."

"These people don't," he grumbled. "I don't think they even *sleep*, not all at once, anyway. Different parts of their brains take—shifts, or something. Like a bunch of dolphins."

"You're not a dolphin, and you're not some augmented wannabe, either. You're *natural*. Just the way I like it. And you know what?"

"What?"

"You're going to keep up with them. You always do."

Not always, he thought.

"You should come back," he said suddenly. Somewhere far away, his fingers and toes tingled faintly.

She shook her head. "We've been over this."

"Nobody's saying you have to go back to the job. There are a million other options."

"In here," she told him, "there are a billion."

He looked at her chain. He had never consciously forged those links. He'd simply found her like this. He could have changed her circumstance with a thought, of course, as he could change anything in this world—but there were always risks.

He'd learned not to push it.

"You can't *like* it here," he said quietly.

She laughed. "Why not? *I* didn't put that thing on."

"But—" His temples throbbed. He willed them to stop.

"Dan," she said gently, "*You* can keep up out there. I can't."

The tingling intensified in his extremities. Rho's face wavered before him, fading to black. He couldn't keep her together much longer. All this careful conservatism, these shackled environments that barely edged beyond the laws of physics—they only guarded against the Inner Heckler, not these unwelcome sensations intruding from *outside*. Headaches. Pins and needles. They distracted from his own contrivance; suddenly the whole façade was falling apart around him. "Come back soon," his wife called through the rising static. "I'll be waiting..."

She was gone before he could answer. He tried to construct something spectacular—the implosion of Heaven itself, a fiery

inward collapse toward some ravenous singularity deep below the Canadian Shield—but he was rising too fast toward the light.

There'd been a time when he'd derided his own lack of imagination, cursed his inability to slip his shackles and just *dream* like everyone else, with glorious hallucinogenic abandon. Even now, sometimes, he had to remind himself: it wasn't a failing at all. It was a strength.

Even in sleep, Dan Brüks didn't take *anything* on faith.

TO HIMSELF EVERYONE IS IMMORTAL; HE MAY KNOW
THAT HE IS GOING TO DIE, BUT HE CAN NEVER KNOW
THAT HE IS DEAD.

—SAMUEL BUTLER

SUNSHINE STABBED HIS eyes through the cell's slotted window. His mouth was dry, his head athrob. His fingers pulsed with dull electricity. *Slept on my hands*, he thought, and tried to imagine how he might have actually done that as he swung his legs over the edge of the bed.

The same pins and needles flooded the soles of his feet when he planted them on the floor.

Great.

He found his way to the lav that Luckett had shown him the night before, emptied his bladder while every extremity tingled and burned. The discomfort was beginning to fade by the time he flushed; he headed off down the empty hall in search of other warm bodies, only slightly unsteady on his feet.

Something thumped behind one of the closed doors. He paused for a moment before continuing, his attention drawn by another door opening farther down the hall.

By the naked blotchy thing that fell into view, choking and twitching as if electrocuted.

He stood there for a moment, shocked into paralysis. Then he was moving again, his own trivial discomfort forgotten in a greater shock of recognition: Masashi the scarecrow, back arched, teeth bared, flesh stretched so tight across cheekbones that it was a wonder his face hadn't split down the middle. Brüks was almost at the man's side before realization stopped him in his tracks.

Every muscle thrown into tetany. This was some kind of motor disorder.

This was *neurological*.

The pins and needles were back in full force. Brüks looked down in disbelief at his own fingertips. Try as he might, he couldn't stop them from trembling.

When the screaming started, he barely heard it.

Whatever it was, it killed quietly. For the most part.

Not because it was painless. Its victims staggered from hiding and thrashed on the floors, faces twisted into agonized devil masks. Even the dead kept them on: veins bulging, eyes splattered crimson with pinpoint embolisms, each face frozen in the same calcified rictus. Not a word, not a groan from any of them. There was nothing he could do but step over the bodies as he tracked that lone voice screaming somewhere ahead; nothing he could feel but that terrifying electricity growing in his fingers and toes; nothing he could think but *It's in me too it's in me too it's in me too*—

Creatures in formation rounded the corner ahead of him: four human bodies moving in perfect step, more live than the bodies on the floor, just as dead inside. Valerie kept pace in their midst. Four sets of jiggling eyes locked onto Brüks for an instant, then resumed their frantic omnidirectional dance. Valerie didn't even look in his direction. She moved as if spring-loaded, as if her joints were subtly out of place. One of her zombies was missing below the knees; the carbon prosthetics it used for legs squeaked softly against the floor as they approached. Apart from that subtle friction, Brüks couldn't

hear so much as a footfall from any of them. He flattened instinctively against the wall, praying to some Pleistocene god for invisibility—or at least, for insignificance. Valerie swept abreast of him, eyes straight ahead.

Brüks squeezed his eyes shut. Soft screams filled the darkness. He felt a small distant pride that none of them came from him. When he opened his eyes again the monster was gone.

The screaming had grown fainter. More—intimate. Some horrific lighthouse beacon running low on batteries, calling through the fog of war. Except this was no fucking war: this was a massacre, this was one tribe of giants slaughtering another, and any baseline fossil stupid enough to get caught underfoot didn't even rate the brutal mercy of a slashed throat on the battlefield.

Welcome to the armistice.

He followed the sound. He doubted there was anything he could do—euthanasia, perhaps—but if it could scream, maybe it could talk. Maybe it could tell him—something...

It already had, in a way. It had told him that all victims were not equal in the eyes of this pestilence. All the Bicamerals he'd seen so far seemed to have fallen within minutes of each other, seized by the throat and turned to tortured stone before they'd even had a chance to cry out. Not everyone, though. Not the vampire and her minions. Not the screamer. Not Dan Brüks.

Not yet.

But he was infected, oh yes he was. Something was at work on his distal circuitry, shorting out his fine motor control, working its way up the main cables. Maybe the screamer was just a little farther along. Maybe the screamer was Daniel Brüks in another ten minutes.

Maybe it was right here, behind this door.

Brüks pushed it open.

Luckett. He squirmed like a hooked eelpout in a cell identical to the one where Brüks had slept, slid around on a floor slippery with his own fluids. Sweat turned his tunic into a soaked dishrag, ran in torrents from his face and limbs; darker

stains spread from his crotch.

The hook hadn't caught him by the mouth, though. It sprouted from a port at the back of his neck, a shivering fiber running to a socket low on the wall. Luckett convulsed. His head struck the edge of an overturned chair. The blow seemed to bring him back a little; the screaming stopped, the eyes cleared, something approaching awareness filtered through the dull animal pain that filled them.

"Brüks," he moaned, "Brüks, get it—*fuck* it hurts..."

Brüks knelt, laid a hand on the other man's shoulder. "I—"

The acolyte thrashed away from the touch, screaming all over again: "Fucking *hell* that hurts—!" He flailed one arm: a deliberate gesture, Brüks guessed, an instruction trying to dig its way out past the roaring static of a million short-circuiting motor nerves. Brüks followed its path to a small glass-fronted cabinet set into the wall. Lozenges of doped ceramic rested in neat labeled rows behind the sliding pane: HAPPINESS, ORGASM, APPETITE SUPPRESSANT—

ANALGESIC.

He grabbed it off the shelf, dropped to Luckett's side, grabbed the fiberop at the cervical end: fumbled as fingers misheard brain. Luckett screamed again, arched his back like a drawn bow. The smell of shit filled the room. Brüks gripped the plug, twisted. The socket clicked free. Seething light flooded the walls: camera feeds, spline plots, deserts painted in garish blizzards of false color. Some tame oracle, deprived of direct access to Luckett's brain, continuing its conversation in meatspace.

Brüks jammed the painkiller home, click-twisted it into place. Luckett sagged instantly; his fingers continued to twitch and shiver, purely galvanic. For a moment Brüks thought the acolyte had lost consciousness. Then Luckett took a great heaving gulp of air, let it out again.

"That's better," he said.

Brüks eyed Luckett's trembling fingers, eyed his own. "It's not. This is—"

"Not my department," Luckett coughed. "Not yours, either,

thank your lucky stars.”

“But what is it? There’s got to be a fix.” He remembered: a rosette of monsters, the vampire at its heart, moving with frictionless efficiency through the dying fields. “Valerie—”

Luckett shook his head. “She’s on our side.”

“But she’s—”

“Not her.” Luckett turned his head, rested his eyes on an overhead real-time tactical of the surrounding desert: the monastery at the bull’s-eye, a perimeter of arcane hieroglyphics around the edges. “Them.”

We’ve been making moves all day.

“What did you do? *What did you do?*”

“Do?” Luckett coughed, wiped blood from his mouth with the back of his hand. “You were here, my friend. We got *noticed*. And now we’re—reaping the whirlwind, you might say.”

“They wouldn’t just—” *Then again, why wouldn’t they?* “Wasn’t there some kind of, of ultimatum? Didn’t they give us a chance to surrender, or—”

The look Luckett gave him was an even mix of pity and amusement.

Brüks cursed himself for an idiot. Headaches for most of the day before. Moore’s *aerosol delivery*. But there’d been no artillery, no lethal canisters lobbed whistling across the desert. This thing had drifted in on the breeze, undetected. And not even engineered germs killed on contact. There was always an incubation period, it always took *time* for a few lucky spores to hatch out in the lungs and breed an army big enough to take down a human body. Even the magic of exponential growth took hours to manifest.

The enemy—

—*People like you*, Lianna had said—

—must have set this plan in motion the moment they’d set up their perimeter. It wouldn’t have mattered one good goddamn if the whole Bicameral Order had marched out across the desert with their hands in the air; the weapon was already in their blood, and it was blind to white flags.

“How could you let them do this?” Brüks hissed. “You’re

supposed to be *smarter* than us, you're post-fucking-*singular*, you're supposed to be ten steps ahead of any plan we poor stupid cavemen could ever put together. *How could you let them?*"

"Oh, but this is all according to plan." Luckett patted him on the arm with one spastic, short-circuiting hand.

"What *plan?*" Brüks choked back a hysterical giggle. "We're *dead* already—"

"Even God can't plan for everything. Too many variables." Luckett coughed again. "Not to worry, though. We planned for the things we couldn't plan for..."

Faintly, through the open door—drifting down the corridor, through high narrow windows; through barred gates, through glass panes looking into deserts and gardens: a *whistling* sound, Doppler-shifted. The muffled thud of some nearby impact.

"Ah. The mopping-up begins." Luckett nodded serenely. "No point being stealthy now, eh?"

Brüks put his head in his hands.

"Don't worry, old chap. It's not over yet, not for you anyway. Jim's lair. He's waiting for you."

Brüks raised his head. "Jim—but—"

"I *told* you," Luckett said. "According to plan." Spasms rippled across his body. "Go."

And now Brüks heard another sound, a deeper sound, rumbling up the scale behind the hacking of the maimed and whistling shriek of inbound paralysis. He felt the vibration of great blades spinning up far down in the earth, heard the muffled hiss of steam injected into deep silos. He heard the growing drumbeat of an elemental monster straining against its chains.

"Now *that*," he said, "is more fucking like it."

Moore was in his bunker, but he wasn't running the show. No controls blinked on the smart paint, no sliders or dials or virtual buttons to press. The readouts were all one-way. Somewhere else, the Bicamerals were bringing their engine online; Moore

was only watching from the bleachers.

He turned at Brüks's approach. "They're dug in."

"Doesn't matter, though, right? We're gonna tear them to pieces."

The soldier turned back to the wall and shook his head.

"What's the problem? They out of range?"

"We're not fighting."

"*Not fighting?* Have you *seen* what they're doing to us?"

"I see."

"Everyone's dead or halfway there!"

"We're not."

"Right." Nerves sang ominously in Brüks's fingers. "And how long is that going to last?"

"Long enough. This bug was customized for Bicamerals. We've got more time." Moore frowned. "You don't engineer something like that in the field, not overnight. They've been planning this awhile."

"They didn't even fire a warning shot, for fucksake! They didn't even try to negotiate!"

"They're scared."

"*They're* scared."

"They'd assume that giving us any advance warning would put them at an unacceptable disadvantage. They don't know what we're capable of."

"Then maybe it's time we showed them."

Moore turned back to face the other man. "Perhaps you're not familiar with Bicameral philosophy. It's predominantly nonviolent."

"You and Lockett and all your friends can argue the philosophical subtleties of unilateral pacifism while we all turn into *predominantly nonviolent* corpses." *Friends*. "Is Lianna—"

"She's fine."

"None of us are *fine*." Brüks turned back to the stairs. Maybe he could find her before the ceiling crashed in. Maybe there was some broom closet he could hide in.

Moore's hand closed on his shoulder and spun him as though he were made of balsa.

"We will not attack these people," he said calmly. "We don't know if they're responsible."

"You just said they'd been *planning* this," Brüks croaked. "They were just waiting for some kind of excuse. You watched them lock and load. For all I know you listened in on their fucking comm chatter, you heard them give the orders. You *know*."

"Doesn't matter. Even if we were right there in their command center. Even if we could take their brains apart synapse by synapse and backtrace every neuron that went into the go-ahead. We would still not know."

"Fuck you. I'm not going to suck your dick just because you trot out the old *no free will* shtick."

"These people could have been used without their knowledge. They could be slaved to an implanted agenda and they'd swear they were making their own decisions the whole time. We will not kill cat's-paws."

"They're not zombies, Moore."

"Whole different species."

"*They're killing us*."

"You're just going to have to trust me on this. Or"—Moore cocked his head, evidently amused—"we could leave you behind to hash it out with them personally."

"Leave me—?"

"We're getting out of here. Why do you think they're warming up the engine?"

Someone had rolled a giant soccer ball into the compound. A dozen fallen monks twitched wide-eyed and tetanic around a geodesic sphere of interlocking padded pentagons, maybe four meters across at the equator. A door-size polygon bent back from that surface like a snapped fingernail.

Some kind of escape pod. No obvious means of propulsion. No *onboard* propulsion, anyway; but rising high above the walls of the enclosure, the funnel spun and roared like an angry jet engine. Brüks craned his neck in search of the top of the thing,

and swallowed, and—

And looked again. Something was scratching an arc across the sky.

“Get in,” Moore said at his elbow. “We don’t have much time.”

Of course they know. They’ve got satellites, they’ve got microdrones, they can look right past these walls and see what we’re doing and just blow it all to shit...

“Missile...,” he croaked.

The sky shattered where he was pointing.

The contrail just *stopped* high overhead, its descending arc amputated halfway to the jet stream; a new sun bloomed at its terminus, a blinding pinpoint, impossibly small and impossibly bright. Brüks wasn’t sure what he really saw in the flash-blinded split second that followed. A great flickering hole opening in the morning sky, a massive piece of that dome peeled back as though God Itself had popped the lid off Its terrarium. The sky *crinkled*: wisps of high-flying cirrus cracking into myriad shards; expanses of deep and endless blue collapsing into sharp-edged facets; half of heaven folded into lunatic origami. The sky *imploded* and left another sky behind, serene and unscarred.

A thunderclap split Brüks’s skull like an ice pick. The force of it lifted him off his feet, dangled him for an endless moment before dropping him back onto the grass. Something pushed him from behind. He turned; Moore’s mouth was moving, but the only sound Brüks could hear was a high-pitched ringing that filled the world. Past Moore’s shoulder, above the ramparts of the monastery, dark smoldering wreckage fell from the sky like the charred bones of some giant stick man. Its empty skin fled sideways across the sky in ragged pieces, great streamers of tinsel drawn toward the shackled tornado. The vortex engine seemed to draw strength from the meal: it grew *thicker*, somehow. Faster. Darker.

Valerie’s invisible airship. He’d forgotten. A hundred thousand cubic meters of hard vacuum directly in the path of the incoming missile: broken on impact, sucking cascades of

desert air into the void.

Moore pushed him toward the sphere. Brüks climbed unsteadily into darkness and the web of some monstrous spider. It was already full of victims, tangled half-seen silhouettes. All hung cocooned in a mesh of broad flat fibers stretching chaotically across the structure's interior.

"Move." A tiny, tinny voice growling through a chorus of tuning forks. Brüks grabbed a convenient band of webbing, gripped as tightly as the sparks in his hand would allow, pulled himself up. Something bumped the side of his head. He turned and recoiled at the face of one of Valerie's zombies, upside-down, eyes jittering, hanging in the mesh like an entangled bat. Brüks yanked back his hand; the webbing stuck as though he were a gecko. He pulled free, clambered up and away from those frantic eyes, that lifeless face.

Another face, not so dead, hung in the gloom behind its bodyguard. Brüks—irises still clenched against the morning sun—couldn't make out details. But he could feel it watching him, could feel the predator grin behind the eyes. He kept moving. Sticky bands embraced at his touch, peeled gently free as he pulled away.

"Any empty spot," Moore said, climbing up in his wake. The ringing in Brüks's ears was fading at last, as if somehow absorbed by this obscene womb and its litter of freaks and monsters. "Try to keep away from the walls; they're padded, but it's going to be a rough ride."

The hatch swung into place like the last piece of a jigsaw, sealed them in and cut off the meager light filtering from outside; instantly the air grew dense and close, a small stagnant bubble at the bottom of the sea. Brüks swallowed. The darkness breathed around him with unseen mouths, a quiet claustrophobic chorus muffled by air heavy as cement.

Vision and ventilation returned within a breath of each other: a stale breeze across his cheek, a dim red glow from the padded facets of the wall itself. Bicamerals blocked the light on all sides: some spread-eagled, some balled up, a couple of pretzel silhouettes that spoke either of superhuman flexibility or

broken bones. Maybe a dozen all told.

A dozen monks. A prehistoric psychopath with an entourage of brain-dead killing machines. Two baseline humans. All hanging together in a giant cobwebbed uterus, waiting for some unseen army to squash them flat.

All part of the plan.

Brüks tried to move, found that the webbing had tightened around him once he'd stopped climbing. He could wriggle like a hooked fish, bring his hand up far enough to scratch his nose. Beyond that he wasn't going anywhere.

His eyes were adapting to the longwave, at least. A face overhead resolved into welcome familiarity: "Lianna? Lianna, are you..."

Only her body was here. Its fingers tapped the side of its head with the telltale rhythm of someone tuned to a more distant reality.

"It's okay." Moore spoke quietly from somewhere nearby. "She's talking to our ride."

"This is it? Twenty people?" He gulped air, still strangely stale for all the efforts of the local life-support system.

"It's enough."

Brüks could barely catch his breath. The whole compartment hissed with the sound of forced ventilation, air washed across his face and still he couldn't seem to fill his lungs.

He fought rising panic. "I think—there's something wrong with the air conditioner..."

"The air's fine. Relax."

"No, it—"

Something kicked them, hard in the side. Suddenly *up* was sideways; suddenly *sideways* was down. Blood rushed to Brüks's head. A giant stood on his chest. The air, already unbearably close, got closer: the stench of rotten eggs flooded Brüks's sinuses like a tsunami.

Jesus Christ, he thought. He couldn't imagine a worse time or place for a fart. Under other circumstances it might have been funny. Now it only made him gag, stole whatever meager oxygen had remained.

“Here we go,” Moore murmured from behind. From below. From overhead.

He sounded almost *sleepy*.

The web slewed. Bodies jerked in unison one way, slung like pendulums back the other, flipped around some arbitrary unknowable center of gravity. They seemed to be accelerating in ten directions at once. Niagara roared in Brüks’s head.

“Can’t—breathe...”

“You’re not supposed to. Go with it.”

“What—”

“Isoflurane. Hydrogen sulfide.”

Whirling static engulfed the world from the outside in. Twenty bodies—barely visible through the maelstrom—threw themselves as one toward some unremarkable point on the far side of the compartment. They strained toward that point like iron filings drawn to a cyclotron, their elastic shackles strained almost to the breaking point.

So, Brüks mused as his vision failed. *This is it. The final conscious experience.*

Enjoy it while it lasts.

PARASITE

The essential wickedness of this approach is perhaps best exemplified by the so-called Moksha Mind engineered by the Eastern Dharmic Alliance. Their attempts to “modernize” their faith—through the embrace of technology that has been (rightly) banned in the West—resulted in a literally soul-destroying hive that has plunged millions into what we can only assume to be a state of deep catatonia. (The fact that this is exactly what the Dharmic faiths have aspired to for millennia does not render their fate any less tragic.) The misguided use of brain interface technology to “commune” with the minds of such alien creatures as cats and octopi—a practice by no means limited to the East—has also resulted in untold psychological damage.

At the opposite extreme, in the face of modern challenges we may find ourselves tempted to simply turn our backs on the wider world. Such a retreat would not only go against the Scriptural admonition to “go and make disciples of all nations,” but also risks dire consequences in its own right. The Redeemer gyland offers a stark case in point. It has been almost a year since the alliance between the Southern and Central Baptists broke down, and three months since we have been able to establish contact with anyone from either side of that conflict. (It is no longer practical to board the gyland directly—any craft approaching within two kilometers is fired upon—but remote surveillance has yielded no evidence of human activity since March 28. The UN believes that the weapons fire is automated, and has declared Redeemer off-limits until those defenses exhaust their ammunition.)

—*An Enemy Within: The Bicameral Threat to*

Institutional Religion in the Twenty-First Century
(An Internal Report to the Holy See by
the Pontifical Academy of Sciences, 2093)

I COULD BE BOUNDED IN A NUTSHELL AND COUNT MYSELF A KING OF INFINITE SPACE, WERE IT NOT THAT I HAVE BAD DREAMS.

—WILLIAM SHAKESPEARE

HE AWOKE TO screams and gray blurry light, a kick in the side, a bolt of pain spiking up his left leg like an electric javelin. He cried out but his voice was lost in some greater cacophony: the sound of torquing metal, vast alloy bones shearing across unaccustomed stress lines. Gravity was all wrong. He was on his back but it tugged him *sideways*, pulled him feetfirst through some translucent rubbery amnion that enveloped his body. Vague shapes loomed and shifted beyond. Down near the subsonic the world groaned like a humpback whale, wounded, spiraling toward a distant seabed. Alarms shrieked on higher frequencies.

I'm in a body bag, he thought, panicking. *They think I'm dead... Maybe I am...*

The pain settled excruciatingly in his ankle. Brüks brought up his hands; weak elastic forces resisted the motion. His veins and arteries were all on the outside, clinging to his skin. *No, not arteries. Myoelectric tensors—*

The world jerked down and sideways. Exhausted metal fell silent; the alarm seemed to bleat all the louder in the absence of competition. Something stabbed Brüks through the body bag, just below the knee. The pain vanished.

A blurry shadow leaned down. “Easy, soldier. I’ve got you.”
Moore.

The membrane split like an opening eye. The Colonel stood over him, leaning thirty degrees off true in a world sliding downhill. The world itself was tiny, a cylindrical bubble five meters across and maybe half that high, floor and walls and roof crazily askew. Something ran through its center like a wire-frame spinal cord (*Access ladder*, Brüks realized dimly: this world had an attic, a basement). Towers of plastic cubes, a

meter on a side—some white, some gunmetal, some darkly transparent (the blurry things inside glistened like internal organs)—loomed on all sides like standing stones, gecked one to another. A few had come loose and settled in an uneven pile at the downhill end of the chamber. Gravity urged Brüks to join them there; if his bag hadn't been fastened to its pallet he would have slid right off the end.

Moore reached out and touched some control past Brüks's line of sight; the alarms fell mercifully silent. "How you holding up?" the soldier asked.

"I'm—" Brüks shook his head, tried to clear it. "What's happening?"

"Spoke must have torqued." Moore reached down/across and peeled something off Brüks's head: a second membranous scalp, a skullcap studded with a grid of tiny nubs. "Loose cube got you. Your ankle's broken. Nothing we can't fix once we get you out of here."

There was *grass* on the walls—meter-wide strips of blue-green grass running from floor to ceiling, alternating with the pipes and grills and concave service panels that disfigured the rest of the bulkhead. (*Amped phyco cyanin*, he remembered from somewhere.) Smart paint glowed serenely from any surface that wasn't given over to photosynthesis. His pallet folded down from an indentation in the wall; a little stack of time-series graphs flickered there, reporting on the state of his insides.

"We're in orbit," he realized.

Moore nodded.

"We're—they hit us—"

Moore smiled faintly. "*Who*, exactly?"

"We were under attack..."

"That was a while ago. On the ground."

"Then—" Brüks swallowed. His ears popped. He'd never been to space before, but he recognized the layout: off-the-shelf hab module, two levels, common as dead satellites from LEO to geosync. You'd sling them around a centrifugal hub to fake gravity. Which would normally be vectored *perpendicular* to the deck, not—

He tried to keep his voice steady. "What's going on?"

"Meteorite strike, maybe. Bad structural component." Moore shrugged. "Alien abduction, for all I know. Anything's possible when you don't have any hard intel to go on."

"You don't—"

"I'm as blind as you are right now, Dr. Brüks. No ConSensus, no intercom. The line must've broken when the spoke torqued. I'll be able to reconnect as soon as someone boosts the signal on the upstream node, but I imagine they have more important things on their minds right now." He laid a hand on Brüks's shoulder. "Relax, Doctor. Help is on the way. Can't you feel it?"

"I—" Brüks hesitated, lifted one rubbery arm, let it drop down/sideways; it seemed to weigh a bit less than it had before.

"They've shut off the centrifuge," Moore confirmed. "We're spinning down smoothly. That suggests the rest of the ship is more or less okay."

Brüks's ears popped again. "We're not. I think—I think there's an air leak somewhere."

"You noticed."

"Shouldn't we be patching it?"

"Have to find it first. Tell you what: I'll move the cargo, you tear apart all these bulkheads."

"But—"

"Or we can go downstairs, suit up, and get out of here." He split Brüks's cocoon open the rest of the way, helped steady him as he sat up. "Can you walk?"

Brüks swung his legs over the edge of the pallet, trying to ignore the subtle sense of pressure building behind his eyes. He gripped its edge to keep from staggering down the skewed deck. Myoelectric tattoos ran the length of his naked body like an impoverished exoskeleton. They traced the bones of his arms and legs, forked out along his toes and—(he flexed his right foot; the left hung insensate at the end of his ankle like a lump of clay)—over his heels and across his soles as well. Every movement met with rubber resistance. Every gesture was a small exercise.

Isometric muscle toner. They used them in Heaven sometimes, to keep the Ascended from curling into flabby fetuses. They still used them on those rare deep-space missions where the crew hadn't been preseasoned with vampire genes, to help in the rearguard fight against the shortening of tendons, the wasting of muscles during hibernation.

Moore helped him stand, offered his body as a crutch. Brüks bounced uncertainly on his good foot, his arm around the other man's shoulders. It wasn't as bad as he'd feared. Pseudograv pulled everything in the wrong direction but it was weak, and getting weaker.

"What am I doing here?" Hop-step-lean. Soft crimson light pulsed from the hole in the ceiling where the ladder emerged, staining the adjacent bulkhead.

"Getting to safety."

"No, I mean—" He gestured with his free arm, took in the containers stacked on all sides. "Why am I in the Hold?"

"The Hold's aft. We're using this for the overflow."

The rails of the ladder were the color of rawhide and smooth as plastic; some elastic polymer that stayed taut along a range of lengths. Brüks reached out and grabbed a rung, looked up through the ceiling and discovered the source of that bloody glow: an emergency hatch sealed tight, flashing a warning to any who might be contemplating passage: UNPRESSURIZED.

"My point is—" He looked through the hole in the floor: more metacubes down there, assemblages of smaller units stuck together. "Why did you wake me up in the basement?"

"You weren't supposed to wake up at all; we had you in a therapeutic coma." Brüks remembered being scalped: that skullcap, stippled with electrodes. "You're lucky I happened to be in the neighborhood when things went south."

"Are you saying you *stored me with*—"

The hab lurched, jumped in some sideways direction Brüks's inner ears couldn't parse; suddenly the ladder was slipping diagonally past, suddenly he was falling through the floor (the edge of the hatch bit his ribs in passing). A giant's building blocks, stacked together, would have snapped his spine under

Earth gravity; here they merely bent it and bounced him back into the air.

Moore caught him on the rebound: "Well, that's one way of making the trip..."

Brüks thrashed in his arms, pushed him away: "*Get the fuck off me!*"

"Calm down, sol—"

"*I'm not your fucking soldier!*" Brüks tried to stand in the crowded space; his wounded ankle twisted under him as though attached by rubber bands. "I'm a *parasitologist*, I was down in the goddamn desert minding my own business. I didn't ask to get caught up in your gang war, I didn't ask to get my ass shot into fucking *orbit*, and I sure as shit didn't ask to get stored down in your *basement* like a box of Christmas ornaments!"

Moore waited until he'd run out of words. "Are you finished?"

Brüks fumed and glared. Moore took his silence for a yes. "I apologize for the inconvenience," he said drily. "Once things have calmed down a bit, maybe we can check in with your wife. Tell her you're working late."

Brüks closed his eyes. "I haven't checked in with my *wife*," he said through gritted teeth, "in years." *My real wife, anyway.*

"Really." Moore refused to take the hint. "Why not?"

"She's in Heaven."

"Huh." Moore grunted. Then, more softly: "So's mine."

Brüks rolled his eyes. "Small world." His ears popped again. "Are we going to get out of here before our blood starts boiling?"

"Let's go, then," Moore said.

Up past a leaning cityscape of cargo cubes, man-size alcoves flanked an ovoid airlock, two to each side. Spacesuits hung there like flensed silver skins, held in place by cargo straps. They billowed gently at the knees and elbows. Moore helped Brüks across the slanted deck, passed him a loose cargo strap to cling to while unbuckling the suit in the leftmost alcove; it sagged sideways into the soldier's arms.

A breeze hissed softly against Brüks's cheek. Moore held out

the suit: gutted from crotch to neck, a split exoskeleton shed by some previous owner. Brüks stood angled and bouncing slightly on his good foot, let Moore guide his bad one into the suit. The low gravity helped; by now Brüks couldn't have weighed more than ten kilos. He felt like some overgrown pupa plagued by second thoughts, trying to climb back into its husk.

An itch crawled across the back of his free hand; he held it up, eyed the blood-brown tracery of elastic filaments webbed across the skin. "Why—"

"So what's she in for?" Moore asked, jerking Brüks's leg hard to seat his injured foot in its boot. Bits of bone ground against each other down there—his tibia carried the vibration past whatever nerve block Moore had installed. It didn't hurt. Brüks grimaced anyway.

"Uh, what?"

"Your wife." The right leg was trickier, without the left to stand on; Moore offered himself as a crutch again. "What's she in Heaven for?"

"That's a strange way of putting it," Brüks remarked.

I'm sick of it, she'd said softly, looking out the window. They're alive, Dan. They're sapient.

Moore shrugged. "Everyone's running from something."

They're just systems, he'd reminded her. Engineered.

So are we, she'd said. He hadn't argued with her; she'd known better. Neither of them had been engineered, not unless you counted natural selection as some kind of designer and neither of them was woolly-minded enough to entertain such sloppy thinking. She hadn't wanted an argument anyway; she'd been long past the verbal jousts that had kept them sparking all those years. Now she'd only wanted to be left alone.

"She—retired," he told Moore as his right foot slid smoothly into its boot.

"From what?"

He'd respected her wishes. Left her alone when she'd lobotomized her last victim, left her alone to tender her resignation. He'd wanted to reach out when she'd started eyeing Heaven, would have done anything to keep her on his

side of the afterlife, but by then it was long past being about what *he* wanted. So he'd left her alone even when she leased out her brain to pay her rent in the Collective Conscious, withdrew from the outer world to the inner. She'd left a link behind, at least. He could always talk to her, there on Styx's farthest shore. She always honored her obligations. But he'd known that's all it was, so even then—after she'd stopped slaughtering artificial systems and started *being* one—he left her alone.

"She was a cloud-killer," Brüks said at last.

"Huh," Moore grunted. Then, helping Brüks's arms into their sleeves: "Not a very good one, I hope."

"Why?"

"Let's just say that not every distributed AI's emergent, and not every emergent AI's rogue." Moore handed over his gauntlets. "We don't publicize it, but every now and then some of the better CKs have been known to pick targets we'd really rather they didn't."

Brüks swallowed on a throat gone suddenly dry. "The fucked-up thing is, she *agreed* with them. The AI Rights idiots, I mean. She quit because she got sick of killing conscious beings whose only crime was"—how had she put it?—"growing up too fast."

Suit zipped up. Gauntlets clicked into place. A solid yank on the boa-cord and the suit *squirmed* around him, cinching from flaccid to skintight in a few disquieting seconds. Moore handed him the helmet: "Seat it facing your three, turn counterclockwise until it clicks. Keep the visor up until I say."

"Really?" Brüks was starting to feel light-headed. "The air seems a little—thin..."

"Plenty of time." Moore grabbed another suit off the wall. "I don't want your hearing compromised." He bounced off the deck, brought knees to chest and spread his suit open with both hands. With one fluid motion he kicked his legs straight back onto the deck, suited to the waist. He bounced lightly.

"So she wasn't afraid of the conscious AIs." Moore shrugged arms into sleeves. "How about the smart ones?"

"W-what?"

“Smart AIs.” He clicked his own helmet into place. “Was she afraid of them?”

Brüks gulped oily alpine air and tried to concentrate. *The smart ones*. Past that minimum complexity threshold where networks wake up: past the Sapience Limit where they go to sleep again, where self-awareness dissolves in the vaster reaches of networks grown too large, in the signal lags that reduce synchrony to static. Up where *intelligence* continues to grow even though the *self* has been left behind.

“Those, she—was a little worried about,” he admitted, trying to ignore the faint roaring in his ears.

“Smart woman.” The Colonel’s voice was strangely tinny. He leaned over and checked Brüks’s seals and sockets with precise mechanical efficiency, nodded. “Okay, drop your visor,” he said, dropping his.

A louder hiss replaced the fainter one: a blessed wash of fresh air caressed Brüks’s face the moment his visor sealed. Relief flooded in a moment later. An arcane mosaic of icons and acronyms flickered to life across the crystal.

Moore’s helmet bumped against his own, his voice buzzing distantly across the makeshift connection: “It’s a saccadal interface. Comm tree’s upper left.” Sure enough an amber star blinked there: a knock at the door. Brüks focused his gaze *just* so and accepted the call.

“That’s better.” Suddenly it was as though Moore was speaking from right inside Brüks’s helmet.

“Let’s get out of here,” Brüks said.

Moore held his arm out, watched it drop. “Not quite yet. Another minute or two.”

Out beyond Brüks’s helmet, the air—the lack of it, maybe—grew somehow *hard*. Through that impoverished atmosphere and two layers of convex crystal, Jim Moore’s face was calm and cryptic.

“What about yours?” Brüks asked after a moment.

“My what?”

“Your wife. What was she—in for?”

“Yes. Helen.” A frown may have flickered across Moore’s face

then, but it was gone in an instant and he was answering before Brüks had a chance to regret the question. “She just got—tired, I suppose. Or maybe scared.” His gaze dropped for a moment. “Twenty-first century’s not for everyone.”

“When did she ascend?”

“Almost fourteen years ago now.”

“Firefall.” A lot of people had fled into Heaven after that. A lot of the Ascended had even come back.

But Moore was shaking his head. “Just before, actually. Literally *minutes* before. We all said good-bye, and then we went outside and I looked up...”

“Maybe she knew something.”

Moore smiled faintly, held out his arm. Brüks watched it drift back to his side, slow as a feather. “Almost—”

The hab lurched. Cubes and cartons teetered and wobbled against their mutual attraction; rogue containers lifted from the deck and bumped against the walls in a ponderous ballet. Brüks and Moore, tethered to their cargo straps, drifted like seaweed.

“—time to go.” Moore dialed open the inner hatch. Brüks pulled himself along in the other man’s wake.

“Jim.”

“Right here.” Moore pulled a spring-loaded clasp from a little disk at his waist. A bright thread unspooled behind it.

“Why *were* you here? When *things went south*?”

“I was on patrol.” Fastening the clasp to a cleat on Brüks’s own suit. “Walking the perimeter.”

“What?”

“You heard me.” The inner hatch squeezed down behind them.

Brüks tugged on the thread while Moore went through the motions of depressurizing the ’lock: impossibly fine, impossibly strong. A leash of engineered spider silk.

“You’ve got a ConSensus feed in your head,” Brüks pointed out. “You can see anyplace on the network without getting off the toilet and you *walk the perimeter*?”

“Twice a day. Going on thirty years. You should be thankful I’ve never seen any reason to stop.” One gauntleted hand made

a small flourish toward the outer hatch. “Shall we go?”

Moore, you old warhorse.

I’m alive thanks to you. I pass out inside a tornado, I wake up with a smashed ankle on a space station with a broken back. You get me into this suit. You get me to natter on about my wife so I barely even notice the air bleeding away around us.

I bet you’ll never tell me how close we came, will you? Not your style. You were too busy distracting me from making a complete panicking ass of myself while you saved my life.

“Thank you,” he said softly, but if Moore—tapping out some incantation on the bulkhead interface—even heard him, he gave no sign.

The outer airlock irised open. The great wide universe waited beyond.

And the magnitude of all Jim Moore’s well-intentioned lies spread naked across the heavens for anyone to see.

“Welcome to the *Crown of Thorns*,” Moore said from the other end of the universe.

The sun was too large, too blinding: Brüks saw that as soon as the outer hatch opened, in the instant before a polarizing disk bloomed on his faceplate—perfectly line of sight—to cut the glare. *Of course*, he thought at first, *no atmosphere*. Things were bound to be brighter in orbit.

And then he stumbled out in Moore’s wake, and toppled weightlessly around some lopsided center of mass while stars and vast structures spun around him.

The Earth was gone.

That wasn’t true, he knew in some distant hypothetical place that made absolutely no difference. It *couldn’t* be true. Earth was still out there somewhere; one of those billion bright shards lacerating the heavens on all sides. Unwinking pixels, all of them. Not a single one close enough to rise above zero dimensions, to actually assume a *shape*.

No ground to fall to.

His breath rasped in his ears, fast as a heartbeat. “You said

we were in *orbit*.”

“We are. Not around Earth.”

The ship—the *Crown of Thorns*—spread before him like the bones of some city-size monster. The broken spoke hung directly ahead, a tangle of struts and tubes suffused in a glittering sharp-edged halo: bits of foil, crystals of frozen liquid, little shurikens of metal with nowhere else to go. Things moved in that mosaic of light and shadow. Metal spiders swarmed across the wreckage, spot-welding with incandescent mandibles, spinning webs to suture shattered pieces back together. Tiny starbursts sparkled across the metalscape in waves.

Not bent. Not torqued. *Broken*. Snapped clean off. Horrified, Brüks took in the sight of a slender silver cable, its diameter barely that of a human finger: a lone tendon, miraculously intact, emerging from the amputated stump and stretching across vacuum to anchor the massive barrel-shaped hab at his back. If not for that one frail thread...

“You knew about this, didn’t you?” He gulped air. “You’ve been hooked into ConSensus all along...”

Moore hung off a handhold, utterly unconcerned by the billions of light-years stretching away beneath his feet. “In my experience, it’s generally better to ease people into these situations a little at a time.”

“It’s not *my* exp—exper—” His tongue was swelling in his mouth. He couldn’t seem to catch his breath. Nowhere was up, nowhere was down—

“My *air*—”

Something smacked the sole of his boot; absurdly, *down* clicked back into place. Moore was in front of him, hands on his shoulders, squeezing through the suit: “It’s okay. It’s okay. Close your eyes.”

Brüks squeezed them tight.

“You’re just hyperventilating,” Moore said from the darkness. “The suit’ll thin the mix before you run any serious risk of passing out. You’re perfectly safe.”

Brüks almost laughed aloud at that. “You—” he managed,

“are The Boy Who *Cried Safe...*”

“You must be feeling better,” Moore observed.

He was, a little.

“Try opening your eyes. Focus on the ship, not the stars. Take your time. Get your bearings.”

Brüks opened them a crack. Vacuum and vertigo came flooding in.

Focus on the ship.

Okay. The ship.

Start with this spoke. Truncated, cauterized, one of—one of six (the others apparently undamaged), radiating from a spherical hub like the skeleton of an impoverished bicycle wheel: no rim, nothing but a tin can at the end of each spoke. A few minutes ago those spokes had been slinging their habs around like stones on strings; now they just hung there. A smaller baton—a giant’s femur skewered through the midpoint—hung equally motionless just fore of the Hub. (Counterspinning flywheel, probably. To neuter the torque.)

Fifty meters long at least, those hollow bones. This insane Ferris wheel stretched over a hundred meters from side to side.

But it was an ephemeral contraption of twigs and straws next to the wall of metal looming behind it. The drive section. Seen from dead-on it would be a disk: a whole landscape turned on edge, a hard-edged topography of ridges and trenches and right angles. But out here on the wounded rim, Brüks could see the mass piled up *behind* that leading edge: not so much a disk as a core sample extracted from some artificial moon. The striated faces of sedimentary cliffs, carved in metal; monstrous gnarled arteries twisting along the patchwork hull, carrying rivers of fuel or coolant. The arc of a distant engine nozzle, peeking past that metal horizon like a dull sunrise.

A cylindrical silo squatted dead center atop the drive section. Cargo hold, perhaps. The *Crown*’s backbone emerged from its apex like a sapling sprouting from the stump of a great redwood. All this forward superstructure—the Hub and its habs, the flywheel, a hemispherical nose assembly bristling with antennae—none of it mattered in the shadow of those

engines. Just a few fragile twigs in which meat might huddle and breathe. Fleas clinging to the back of a captive sun.

“This thing is *huge*,” Brüks whispered to Moore. But Moore wasn’t there anymore; he was sailing spread-eagled across the gap between this dangling hab and its severed spoke. Moore was deserting him for an army of spiders.

Something tugged on Brüks’s tether. He turned, ice water trickling along his spine, to see what new master held his leash.

“You come with me,” Valerie said.

She yanked him across the void like bait on a hook, faster than even his brain stem could react. By the time it reached out to snatch a passing holdfast—before it could even look around to *find* one—they were already arcing through clouds of jagged tinsel. Torn scaffolding reached out as he tumbled past; miraculously, none tore his suit.

He was falling down a well—*Not a well. The spoke. The broken spoke.* He could see its ragged mouth receding above him. He hit bottom, landed hard on his back; elastic inertia tried to bounce him off but a pile-driver slammed against his chest and held him fast. Blood-orange light pulsed at the edge of his eye. He sucked in great panicky gulps of air, turned his head.

The pile-driver extended from Valerie’s shoulder. Her other hand worked controls set into the dropgate they’d landed on. Crimson light flashed at two-second intervals around its edge.

“Moore—” Brüks gasped.

“Wastes too much time on you already, Cold Cut. He helps with repairs.” A hatch split open in the center of the dropgate. Valerie pitched him through one-handed. Something caught him like a catcher’s mitt on the other side: a resilient membrane, stretched between hoops of tensile ribbing. Vacuum sucked at that translucent skin, stretched it tightly convex between those reinforcements.

Valerie sealed the hatch behind them. The little tent inflated instantly, its skin relaxing as the gradient leveled.

Tingling in the fingers of Brüks’s left hand; clenched tight, he

realized. He forced them open, was vaguely surprised to see a little piece of shrapnel floating on his palm. Its edges weren't entirely jagged. The metal had flowed and congealed in spots, like candle wax.

He must have grabbed it in passing.

The tent split like a clamshell. Valerie dragged him out before it had fully opened, pulled him along a tunnel of pale watery light. A headless brown serpent convulsed along its length, coils slapping the bulkheads with random energy: some kind of elastic cord, thick as his wrist and intermittently studded with little hoops. The rungs of a ladder, too far apart for merely human reach, strobed past on the bulkhead. Occasional flourishes of yellow-and-black hazard striping, flashing by too quickly for any glimpse of whatever they warned against. Brüks craned his neck, eyes forward. Sometime in the past few seconds Valerie had raised her visor. Her face was gray in the shade of her helmet, all planes and angles. Bones and no flesh.

The spoke ended in a slotted dome, like one of those antique telescopes left to rot on mountaintops after astronomy had moved offworld. Most of that slot was blocked by the socket on the other side. They ricocheted through the gap that remained.

They emerged into the space between two concentric spheres: a silvery inner core, like a great blob of mercury three meters across; an outer shell, dull and unreflective, containing it. Some kind of grille split the space between into hemispheres, joined crust to core at the equator. Valerie dragged him across the bowl of the aft hemisphere: around a cubist landscape of cargo modules, past the mouth of a gaping tunnel at the south pole (the spine of the ship, Brüks realized; shadows and scaffolds receded down its throat); past the ball-and-socket assemblies of other spokes, arrayed around that opening like a corolla. Brüks caught flickers of motion through the equatorial grille—personnel in the other hemisphere, otherwise occupied as Valerie dragged him to his fate—but in the next instant they were diving down another one of the *Crown's* long bones and the faint tinny voice he might have heard through his sealed

helmet—

—*Fuck me the roach is up!*—

—could just as well have been imagination.

Another long fall; this time they were being towed. The serpent in this spoke was intact, a moving belt stretched pencil-thin between pulleys at each end. Valerie still gripped Brüks's wrist with one iron hand. The other was locked around one of the hoops (handholds, Brüks realized; stirrups) on the conveyor's outbound leg. The inbound line streamed past just a meter or two to his left, heading back to the Hub. In some hopeful parallel fantasy world, Brüks broke free and seized one of those hoops to make his escape.

Another terminus—this one innocent of shrapnel or wreckage, just a U-turn and a ledge around an open hatch festooned with a bit of signage:

MAINTENANCE & REPAIR

Now they were through. Now he was free, floating in a hab like the one he'd just escaped. Bulkheads, panels, gengineered strips of photosynthetic foliage. Coffin-size outlines, subtly convex, on the bulkhead: pallets like the one he'd awakened on, folded into the wall while not in use. More of those ubiquitous cubes, stuck and stacked high enough to turn half the compartment into a burrow: a spectrum of colors, a riot of icons. Brüks recognized some of the symbols—power tools, fab-matter stockpiles, the stylized Aesculapian staff that meant *medical*. Others might as well have been scribbled by aliens.

“Catch.”

He turned, flinched, brought his hands up barely in time to grab the box sailing toward him. It might have held a large pizza, judging by size and shape; maybe three of them, stacked. Scasers, adhesives, bladders of synthetic blood nestled in molded depressions under its lid. Some kind of bare-bones first-aid kit.

“Fix it.”

Somehow Valerie had already stripped down to her coverall,

geckoed her abandoned spacesuit to the wall like a crumpled wad of aluminum foil. Her left arm was extended, wrist up, sleeve rolled back. Her forearm bent just slightly, halfway down its length. Not even vampires had joints there.

“What—how did—”

“The ship breaks. Shit happens.” Her lips drew back. Her teeth looked almost translucent in the glassy light. “Fix it.”

“But—my ankle—”

Suddenly they were eye to eye. Brüks reflexively dropped his gaze: a lamb in a lion’s presence, no recourse beyond obeisance, no hope beyond prayer.

“Two injured elements,” Valerie whispered. “One mission-critical, one ballast. Which gets priority?”

“But I don’t—”

“You’re a biologist.”

“Yes but—”

“An expert. On life.”

“Y-yes...”

“So *fix it*.”

He tried to meet her eyes, and couldn’t, and cursed himself. “I’m not a medical—”

“Bones are bones.” From the corner of his eye he saw her head tilt, as if weighing alternatives. “You can’t do this, what good are you?”

“There must be some kind of sick bay on board,” he stammered. “A, an infirmary.”

The vampire’s eyes flickered to the hatch overhead, to the label it framed: MAINTENANCE & REPAIR. “A biologist,” she said, something like mirth in her voice, “and you think there’s a *difference*.”

This is insane, he thought. *Is this is some kind of test?*

If so, he was failing it.

He held his breath and his tongue, kept his eyes on the injury: closed fracture, thank Christ. No skin breaks, no visible contusions. At least the break hadn’t torn any major blood vessels.

Or had it? Didn’t vampires—that’s right, they vasoconstricted

most of the time, kept most of their blood sequestered in the core. This creature's radial artery could be ripped wide open and she might never even feel it until she went into hunting mode...

Maybe give her prey a fighting chance, at least..

He tamped down on the thought, irrationally terrified that she might be able to see it flickering there in his skull. He focused on the bend instead: leave it, or try to reseat the bone? (*Leave it*, he remembered from somewhere. *Keep movement to a minimum, reduce the risk of shredding nerves and blood vessels...*)

He pulled a roll of splinting tape from the kit, snapped off a few thirty-centimeter lengths (long enough to extend past the wrist—it was starting to come back). He laid them down equidistantly around Valerie's arm (*God she's cold*), pressed gently into the flesh (*Don't hurt her, don't fucking hurt her*) until the adhesive took and hardened the splints into place. He backed away as the vampire flexed and turned and examined his handiwork.

"Not set straight," she remarked.

He swallowed. "No, I thought—this is just temp—"

She reached across with her right hand and broke her own forearm like a sapling. Two of the splints snapped with a sound of tiny gunshots; the third simply ripped free of the flesh, tearing the skin.

The fascia beneath was bloodless as paraffin.

She extended the refractured arm. "Do it again."

Holy shit, Brüks thought.

Fuck fuck fuck.

Not a test, he realized. *Never a test, not with this thing. A game. A sick sadistic game, a cat playing with a mouse...*

Valerie waited, patient and empty, less than two meters from his jugular.

Keep going. Don't give her an excuse.

He took her arm in his hands again. He clenched tight to keep them from shaking; she didn't seem to notice. The break was worse now, the bend sharper; bone pushed up from beneath the muscles, raised a knotty little hillock under the

skin. A purple bruise was leaking into existence at its summit.

He still couldn't meet her eyes.

He grabbed her wrist with one hand, braced against the cup of her elbow with the other, *pulled*. It was like trying to stretch steel: the cables in her arm seemed too tough, too tightly sprung for mere flesh. He tried again, yanked as hard as he could; *he* was the one who whimpered aloud.

But the limb stretched a little, and the broken pieces within ground audibly one against another, and when he let go, the lumpy protuberance had disappeared.

Please let this be enough.

He left the broken splints in place, laid down new lengths of tape adjacent. Pressed and waited as they grew rigid.

"Better," Valerie said. Brüks allowed himself a breath.

Crack. Snap.

"Again," Valerie said.

"*What's wrong with you?*" The words were out before he could catch them. Brüks froze in their wake, terrified at the prospect of her reaction.

She bled. The bone was visible now beneath stretched skin, like a jagged deadhead in murky water. The contusion around it expanded as he watched, a bloody stain spreading through wax. But no, not wax, not anymore; the pallor was fading from Valerie's flesh. Blood was seeping from the core, perfusing the peripheral tissues. The vampire—*warmed*—

She's vasodilating, he realized. *She's switching into hunting mode. Not a game after all, not even an excuse.*

A trigger...

"I've got it," said a voice from behind.

Brüks tried to turn. Valerie's impassive gaze pinned him like a butterfly.

"No, really." A pale flash, a beige jumpsuit. Lianna coasted into view and braked against the wall. "I can finish up here. I think your guys need some supervision out on the hull anyway."

Valerie's eyes flickered to her broken arm, back to Brüks. He blinked and she was gone.

“Let’s get you out of that suit,” Lianna said, unscrewing his helmet.

She’d cut her hair. Her dreads ended along the jawline now.

Brüks sagged and shook his head. “How can you talk to her like that?”

“What? I just—talk.” The helmet tumbled off across the compartment. Brüks fumbled with zippers and clasps, still quaking; Lianna unlocked his gauntlets. “Nothing special.”

“No, I mean—” He took a breath. “Doesn’t she scare the shit out of you?”

“Yeah, I suppose.” She glanced at the first-aid kit drifting to one side. “Holy shit, she had you using *that*?”

“That creature is fucking *insane*.”

Lianna shrugged. “By human standards, sure. Then again—” She tapped the bulkhead with her toe: a diagnostic pallet unfolded from its dimple in the wall. “Not much point in bringing them all the way back from the Pleistocene if their brains worked just like ours, right?”

“Weren’t you afraid?”

She seemed to think about that for a moment. “Guess I was, in a way. I mean, predator-prey, right? Gut response.”

“Exactly.”

“Chinedum said there was nothing to worry about.” She gestured him over to the pallet; he floated into place, let her strap him down around the waist. Biotelemetry readouts bloomed across the bulkhead.

“And you believed him. Them.” It. Whatever the pronoun was for *hive*.

“Of course.” She ran her finger down the stack of biosigns, winced at something she saw there. “Okay, let’s see what we’ve got.”

She cast her gaze around the compartment (“We should really get around to unpacking this stuff sometime”), opened a silver crate tagged with medical icons. A few seconds of rummaging turned up a scaffolding gun from the instrument trays stacked within. She dialed it to OSTEO and set the muzzle against his broken ankle. “You’re nerve-blocked, right?”

He nodded. “Jim shot me up with something.”

“Good. ‘Cause otherwise this would *really* hurt.” She fired. Brüks’s leg jumped reflexively; he caught a glimpse of black filaments, fine as filaria, lashing frantic tails before they burrowed into his flesh and disappeared.

“Might itch for a bit once the block wears off.” Lianna was already scanning the compartment for other treasures. “Takes a while for the mesh to line itself up when you’re dealing with all those little bones—ah.” An off-ivory cube, this time—no, a *transparent* one. It took its color from the viscous casting putty inside: the stuff quivered like gelatin when she cracked the lid.

There must have been enough in there to put ten people into full-body casts. Brüks glanced around while Lianna scooped up a handful; at least a half-dozen other crates were filled with the same stuff.

The putty squirmed in Lianna’s hand, aroused by her body heat. “Where are we going?” Brüks wondered. “How many broken bones are you expecting when we get there?”

“Oh, they don’t *expect* anything. They just like being prepared.” She slapped the goop onto his ankle. “Hold still until it sets.” It slithered around the joint like a monstrous amoeba, fused to itself, crept a few centimeters up his calf and down around his heel before slowing and hardening in the oxygen atmosphere.

“There.” Lianna was back at the cube, resealing it before the rest of its contents crusted over. “You’ll have to wear that for a few days, I’m afraid. Normally we’d have it off in eight hours but you’re still fighting traces of the bug. Might stage a comeback if we crank your metabolism too high.”

The bug.

Luckett, screaming in agony. A lawn littered with twisted bodies. A disease so merciless, so fast that it didn’t even wait for its victims to die before throwing them into rigor mortis.

Brüks closed his eyes. “How many?”

“What—”

“Did we leave behind.”

“You know, Dan, I wouldn’t write those guys off. I know how

bad it looked, but if I've learned anything, it's that you don't second-guess the Bicams. They're always ten steps ahead, and they've always got plans within plans."

He waited until the voice beyond his eyelids finished talking. Then he asked again.

It didn't answer at first. Then: "Forty-four."

"Ten steps ahead," he repeated in his own personal darkness. "You believe that."

"I do," the voice said solemnly.

"They expected forty-four deaths. They planned it. They *wanted* it."

"They didn't *want*—"

"And when they brought that—that *monster* along for the ride, they knew exactly what they were doing. They have it all under control."

"Yes. They do." There wasn't the slightest hint of doubt in the voice.

Brüks took a breath, let it out again, reflected on the faint unexpected scent of growing things at the back of his throat.

"I get the sense that faith doesn't come easily to you," the voice said gently after a few moments. "But sometimes things are just, you know. God's will."

He opened his eyes. Lianna stared at him, kind and gentle and utterly delusional.

"Please don't say that," Brüks said.

"Why not?" She seemed genuinely puzzled.

"Because you can't possibly believe—because it's a fairy tale, and it's been used to excuse way too much..."

"It's not a fairy tale, Dan. I believe in a creative force beyond the physical realm. I believe it gave rise to all life. You can't blame it for all the horrible shit that's been done in its name."

Faint tingling in his fingers. A tide of saliva rising at the back of his throat. His tongue seemed to swell in his mouth.

"Could you—I'd like to be alone, if you don't mind," he said softly.

Lianna blinked. "Uh...sure, I guess. You can ditch the mesh anytime. I brought you a fresh jumpsuit, it's over there on the

pad. ConSensus is hooked in to the paint job if you need anything, just tap three times. The interface is pretty—”

I'm going to throw up, he thought. “Please,” he managed. “Just go.” And closed his eyes again, and clenched his teeth, and choked back the rising nausea until the sounds of her retreat faded away and all he could hear were the voices of machines and the roaring in his head.

He did not throw up. He drew his legs to his chest, and wrapped his arms around them, and held them tight against the sudden uncontrollable shaking of his body. He kept his eyes clenched against the new world, against this microcosmic prison into which he'd awakened: infested by freaks and hungry predators, an insignificant bubble spinning farther from home with each passing second. Earth was only a memory now, lost and receding in an infinite void; and yet Earth was right here in his head, inescapable, a desert garden strewn with twisted corpses.

Every one had Lockett's face.

WE LEARN GEOLOGY THE MORNING AFTER THE EARTH-
QUAKE.

—RALPH WALDO EMERSON

EVENTUALLY THE PANIC receded. Eventually he had to come back.

He wasn't sure how long he floated there. For the present he was content to take refuge in the darkness behind his own eyelids, in the hiss of ventilators and the soft beeping voices of medical monitors. Some kind of alarm chimed in the middle distance; it sounded five times and fell silent. A moment later the world lurched to the right and gentle pressure began to build against his shoulder blades, against his calves and heels. Up and down returned.

Brüks opened his eyes. The view hadn't changed.

He sat up, turned, let this new gravity drop his legs over the side of the pallet (his vitals vanished from the bulkhead as he rose). He fought off a threat of dizziness from his inner ears, held his hand out in front of him, watched until it stopped shaking.

The exoskeleton vibrated ecstatically as he peeled it away, each strip snapping back to some elastic minimum as he set it free. They took body hair and skin cells with them, left denuded strips along his body. He left it trembling on the deck, a tangled ball of rubbery ligaments that shivered and twitched as if alive.

He found his way to a lav that peeked around a small mountain of in-flight luggage, raided the bulkhead food fabber on the way back. Sucking a squeezebulb full of electrolytes, he peeled fresh folded clothing from the wall where Lianna had left it: a forest-green jumpsuit, preemptively custom-fabbed by some onboard printer. He wobbled precariously while pulling on the pants, but the pseudograv was weak and forgiving. Finally he was finished: clothed, upright, his batteries beginning to soak up charge from the nutrients in his gut. He folded the pallet back into its alcove. Its smart-painted underside bulged subtly from the wall, softly luminescent.

Tap three times, she'd said.

ConSensus bloomed at his touch, an impoverished interface for the augmentally impaired: Systems, Comm, Library. A little v3-D *Crown of Thorns* hovered to one side in an imaginary void. All waited to dance at his fingertips, but he took VOCAL INTERFACE AVAILABLE at its word and said, "Ship layout."

The animation expanded smoothly into center stage, bristling with annotations. Engines and reactors and shielding swallowed at least three-quarters of the display: thrust cones, fusion reactors, the rippling toroidal contours of great rad-blocking magnetic fields. Shock absorbers and antiproton traps and great protective slabs of lithium hydride. Brüks had seen the tech thumbnailed for short attention spans on any number of popsci feeds. Antimatter microfusion, they called it. A nuclear pulse

drive turbocharged with a judicious sprinkling of antiprotons. Give it a decent launch window and the *Crown of Thorns* could make it to Mars in a couple of weeks.

“What’s our heading?” he asked aloud.

NAV UNAVAILABLE, ConSensus replied.

“What’s our location?”

NAV UNAVAILABLE.

“What’s our destination, then?”

NAV UNAVAILABLE.

Huh.

The *Crown’s* habitable reaches lay along a spine one hundred fifty meters long, a tube of alloy and atmosphere connecting bits of superstructure like beads on a nail. The Hub Valerie had dragged him through was two-thirds of the way from drive to prow. Its spokes were back in motion, sweeping through space in majestic counterpoint to the flywheel farther up. (Only the Hub’s aft hemisphere rotated, Brüks noticed. The other—COMMAND, according to ConSensus, as if any modern space vessel required anything as quaint as a *bridge* in physical space—seemed fixed to the spine.)

“Focus habitat.”

The *Crown* redrew herself from the inside, engines and shielding neatly excised, nothing left but the hollows of the *Crown’s* forward section turning bright and front and center. Annotated constellations twinkled in those spaces like fireflies in a luminous gut. A cluster of gray icons glowed aft in the HOLD (enormous now, in the absence of its substrate): CHODOROWSKA, K.; EULALI, S.; OFOEGBU, C. Eight or nine others. MOORE, J.—green—glowed in the hab called DORM. LUTTERODT, L. was in the Hub, next to SENGUPTA, R. The hab containing BRÜKS, D. showed up as MED/MAINTENANCE, no matter what the sign on the hatch said; GALLEY/COMMONS occupied the hab immediately clockwise, LAB the one counter. STORES/TRIM, where he’d suffered his rude awakening, balanced out the wheel. Evidently it had already been reattached; but yellow neon highlighted distal injuries where the spoke was still under repair.

The last hab didn’t come with a label. Six stars shone there,

though: five gray, one green. Only the green carried an ID, and it didn't follow the usual format.

VALERIE, was all it said.

Fifty meters farther forward—past the Hub, past some kind of attic full of plumbing and circuitry and airlocks, way up past the main sensor array at the very front of the ship—ConSensus had drawn a hemispherical nose assembly and called it PARASOL. It appeared to be packed away for the time being but a translucent overlay showed it unfurled, a great flattened cone wide enough for the whole ship to hide behind. Brüks had no idea what it was. Space-dust deflector, maybe. Heat radiator. Magic Bicameral Cloak of Invisibility.

"Root." The *Crown* dwindled on the wall, slipped back into line with the other thumbnails.

A Quinternet icon! He tore it open like a Christmas present. He didn't have access to his preferences but even the Noosphere's generic headlines were like water in the desert: ANARRES SECEDES, FFE KILLS VENTER, PAKISTAN'S ZOMBIE PREZ—

Just a cache, of course. A stale-dated abstract small enough to fit into the *Crown's* memory—unless someone was breaking silent-running protocols dating all the way back to Firefall, or tightbeaming updates directly to the *Crown*. Anything was possible.

Probably a cache, though. In which case all he had to do was sort the available content by posting date, and—

Twenty-eight days. Assuming they'd grabbed the cache on their way out the door, he'd been stashed in the basement for almost a month.

He snorted softly and shook his head, vaguely surprised at his own lack of surprise. *I'm growing immune to revelation.*

Still. Stale rations were better than none. And it wasn't as though he had anyplace else to be.

The president of Pakistan had finally, to no one's great surprise, been unmasked as an avatar: the original had succumbed to viral zombieism almost a year before, almost certainly an assassination although no one was claiming responsibility. Venter Biomorphics—the last of the old-time

corporations—had finally lost the fight against entropy and been swept away. A few proximists pointed their fingers at China’s agricultural collapse (that nation was still nose-diving three years after Venter’s artificial pollinators had crashed), but smart money blamed the incandescent hand of Forest Fire Economics. Something called *jitterbug*—some kind of weaponized mirror-neuron thing that hijacked its victims’ motor-control circuits—was doing the rounds in Latin America. And way out at L-5 (way *in*, Brüks corrected himself; way *back*), the Anarres colony had bolted a row of antique VASIM-R engines onto their belly and were preparing to take secession to new heights.

ConSensus chimed. “Roaches to the Hub,” the wall barked in its wake. A female voice, strangely familiar although Brüks couldn’t put his finger on it. He returned to the cache, searched for references to a disturbance in the Oregon desert.

Nothing.

No mention of a mysterious nighttime skirmish on the Prineville Reserve: no zombie assault on religious fortifications, no counterattacking tornadoes impossibly slaved to human commands. No reports of armed forces keeping low to the ground, bivouacked around some cultist bull’s-eye on the desert plain.

Odd.

Maybe their final hurried exodus from that arena never made it into the cache. Brüks had been unconscious at the time but he imagined the *Crown* might not have lingered in orbit long enough to refresh its memory with newborn updates. Still. Valerie’s assault, the armistice, the quarantine—at least thirty solid hours of activity that should have pushed the needle about ten standard deevs above background. Even if there’d been no eyes on Prineville that night, someone would have noticed the sudden redeployment of personnel from previous assignments. Even if Valerie *had* blinded all those skeyes up in geosynch, the disappearance of her hijacked carousel from its garage would have registered somewhere.

The world had too many windows. Every house was glass. It

had been decades since any single entity—corporate, political, or synthetic—had been able to draw the blinds on all of them.

Maybe someone had just scrubbed the onboard cache. The same someone who had apparently locked him out of *you-are-here*.

Because this is all about you. Keeping you in the dark is everyone's top priority.

He winced.

“Roaches to the Hub. You think we’ve got nothing better to do than watch you fondle your dick?”

Brüks blinked, looked around. “What?”

“Uh, she means you, Dan,” Lianna said invisibly. “Kind of a briefing. Thought you might like to know what’s going on.”

“Oh. I—”

Roaches?

“—I’ll be right there.”

The ladder stretched through the center of the compartment like a strand of DNA stretched straight. Brüks leaned across the hatch from which it emerged—still a bit wobbly in the spin—grabbed its rails, and peered into the basement. Stacked crates down there, lengths of dismembered plumbing. He craned his neck; overhead, the ladder rose into pale blue light.

The only way out was up. He took a breath and raised his foot.

The ladder left him at the bottom of the spoke, on a circular ledge framing the hatch. Another ladder opposite stretched up into the distance like an exercise in perspective geometry. He had not been hallucinating before: its rungs were easily a meter apart, unclimbable in Earth gravity. An easy enough reach here, though, under half that pull.

Not that it mattered. The ladder was only a fallback. The conveyor belt descended smoothly into its burrow to his left, passed around some hidden wheel beneath his feet, rose again toward the Hub. Its stirrup-handholds swept past at two-meter intervals, thoughtfully spaced for a foot and a hand. Going up;

going down.

Going up.

Even under power the ascent seemed light-years long, an infinite regression of rungs and rings and bulkheads that almost seemed to breathe when he wasn't looking. The belt drew him up through a series of telescoping segments; hazard striping highlighted the spots where each handed off to the next, where the bore of the tunnel increased by some fractional increment. Little readouts, logarithmically spaced along the bulkhead, pegged the gravity—0.3, 0.25, 0.2—as he rose.

Halfway up, the panic returned.

He had a few seconds' warning: a sudden formless disquiet spreading through the gut, an anxiety that his civilized neocortex tried to write off as simple acrophobia. In the next instant it metastasized into a bone-chilling terror that froze him solid. Suddenly his breathing was fast as a hummingbird's heartbeat; suddenly his fingers were clenched tight as old roots around a rock.

He waited, paralyzed, for some nameless horror to rise in his sight and tear him limb from limb. Nothing did. He forced himself to move. His head turned like a rusted valve, creaked left, right; his eyes rolled frantically in search of threats.

Nothing. An intersegmental gasket passed around him. The rungs of the ladder ticked unremarkably by. Something flickered at the corner of—but no. Nothing there.

Nothing at all.

Over endless seconds time resumed its normal flow; the panic slouched back to the bottom of his brain. Brüks looked back down the way he'd come. His stomach stirred uneasily, but he saw nothing to provoke the slightest unease.

Down had disappeared by the time he reached top; Coriolis, pulling him gently sideways, persisted a few moments longer. He emerged near the bottom of the southern hemisphere, from one of the six teardrop protuberances ringing the south pole. The tunnel he'd glimpsed there before was sealed now, a waist-high railing around its perimeter, a great foil hatch squeezed tight as a sphincter across its mouth. An iris with no pupil. Its

fish-eye reflection turned the mirrorball opposite into a blind chrome eyeball.

He turned to face the grille bisecting the Hub: the rings of some mercurial Saturn, closed in a tight hug. Fragments, flickers of motion were visible through that rotating mesh (*stationary* mesh, he corrected himself; it was this *lower* hemisphere that turned): the bottoms of bare feet, a flash of yellow rendered in a fractured mosaic. An insect's-eye view.

Soft voices filtered back through the grille. The yellow fragments moved like a school of fish. "Come on up."

Moore's voice.

There were two routes forward, two circular openings in the grate on opposite sides of the mirrorball. One was blocked by a retracted spiral staircase squashed almost flat, a black metal pie chart cut into staggered slices: a vital thoroughfare when the engines burned, when acceleration turned *forward* into *up*. A useless bit of lawn sculpture now, pulled up and out of the way.

The other was clear, though. Brüks kicked off from the bulkhead, sailed through the air with a mix of exhilaration and mild terror, flailed as the opening drifted lazily past and left him grabbing at the grille a couple of meters antispinward. Chastened, he clambered sideways and through like a crab emerging from its burrow, floated into the northern hemisphere between mirrored earth and smart-painted sky.

Moore stood barefoot, toes curled into the grating, attention focused on a tacband wrapped around his forearm. Mimetic G-couches disfigured the northern half of the mirrorball like body-cast impressions pressed into cookie dough. They ranged radially around the temperate zone, their headrests converging toward the pole. Anyone installed in one of those couches would find themselves looking forward onto the Hub's northern hemisphere: the dome of an indoor sky, a featureless wash of smart paint save for one spot where yet another redundant ladder stretched from the grille to a hatch just to one side of the north pole.

A Hindian woman strapped into the mirrorball—late twenties perhaps, blunt dark bangs, nape shaved halfway to the crest of

her skull—jerked her head away the moment Brüks tried to meet her eyes. Something seemed to catch her attention down by her right foot. “About fucking time.” She wore a chromaform vest over her orange jumpsuit (*We’re color-coded*, Brüks realized): infinitely programmable, but all it showed now was a translucent render of the very couch she was strapped into. It turned her into a pair of arms and a floating head grafted to a ghostly body.

Lianna hovered off the grille on the far side of the compartment. She flashed a smile that broadcast welcome and apology in equal measure. “Dan Brüks, Rakshi Sengupta.”

Brüks took another look around the dome; “Uh, Valerie...”

“Won’t be joining us,” Lianna said.

“Fixing her *arm*,” Sengupta added.

Thank Christ.

“So,” Moore began, clearly eager to cut to the chase now that the straggler had arrived. “What was it?”

Sengupta rolled her eyes. “Whaddya *think* they burned through the felching spoke it was an *attack*.”

Who, Brüks wondered, and held his tongue.

“I was hoping for a bit more detail,” Moore said mildly, unfazed.

Lianna obliged. “Basically they turned a magnifying glass on us. Focused microwave pulse, about half a gigawatt judging by the damage.”

“From where?” Moore asked.

Lianna bit her lip. “Sun. Northern hemisphere.”

“That’s it?”

“Even Bicams have limits, Jim. It’s pure hindsight; differential heat stress on different facets of the structure, spoke trajectory—basically they just back-calced how the different parts were lined up at the time, figured a bearing from the angle of the hit.”

“Coulda done that ourselves,” Sengupta grumbled.

“*Who*?” Brüks blurted out. “Who hit us?”

Nobody spoke. Sengupta regarded something in his general direction the way she might examine a bit of fecal matter

scraped off her boot.

"That's what we're trying to figure out," Lianna said after a moment.

Moore pursed his lips. "So the hive didn't see it coming."

She shook her head, as if reluctant to admit to the shortcoming out loud.

"Tran, then."

"It'd be one for the books if a *baseline* caught them with their pants down."

Moore's eyes flickered to stern. "Under normal circumstances, certainly. They're not exactly operating at a hundred percent."

Gray icons, clustered in the Hold. "Uh—" Brüks cleared his throat. "What are they doing back there, exactly?"

"Convalescing," Lianna said. "Bug hit them a lot harder than it hit us. We've pumped up the pressure to speed their recovery, but it'll still be days."

"So after the break," Moore mused.

Break?

Lianna nodded. "We'll have to boot up at least a week early on the other end. They want the option of going hands-on."

"Hands-on *where?*" Brüks wondered. "What *bre*—"

Sengupta cut him off with an exasperated whistle through clenched teeth, turned to Lianna: "Didn't I *tell* you?"

"If you could hold on to your questions for the moment," Moore suggested, "I'll be happy to fill you in later."

"When you won't be wasting everyone *else's* time," Sengupta added.

"Rak," Lianna began.

"Why is he even *here* does anyone expect him to actually *do* anything other than *feel included?*"

"Is that what I'm feeling," Brüks remarked.

"It's not exactly *Dan* who's wasting our time right now," Lianna pointed out.

Sengupta snorted.

Moore waited a beat before getting back to business. "Are there any weapons that could do this from that range?"

Lianna shrugged. "You're the spook. You tell me."

“I’m not talking about baseline tech.”

“This doesn’t look like a dedicated weapon. More likely someone hijacked a bunch of powersats to fire simultaneously at the same spot. Probably a one-shot deal, too; you don’t get that kind of output by staying inside the rated specs. Probably blew the circuits across the whole network, maybe even past their healing threshold.”

“Wouldn’t matter anyway with a twelve-minute lag. They had one chance to anticipate our position and they blew it. Rakshi, are—”

“Quarter-second thruster squirts random intervals between six and twelve minutes. You won’t even feel ’em but those fuckers won’t be forecasting *me* again.”

Twelve-minute light speed lag, Brüks reflected. From the sun and back. So we’re six light-minutes from the sun, which puts us, puts us...

One hundred eight million kilometers. Close as Venus, if he remembered his basic astronomy.

“—impact our tipping point?” Moore was asking

Lianna nodded. “But not enough to matter. They’re working through the revisions now. Another couple of hours, they say.”

“And what about our tail?”

Sengupta painted invisible strokes in the air. A window opened on the dome: some kind of plasma plot, three red spikes erupting from a landscape of violet foothills. The details wobbled in real time but those peaks stayed constant. Up in one corner arcane annotations nattered on about DISCRIMINANT COMPLEX and INFRARED OCCLUSION and MICROLENSING.

Heatprints of some kind, Brüks guessed. Cloaked, judging from the annotations, but apparently Sengupta had magic fingers.

They were being followed. *This just keeps getting better.*

“So.” Moore considered. “Two prongs or two players?”

“Prongs, probably. The Bicams think the shot was meant to disable us enough to let them catch up.” Lianna hummed. “I *wondered* why they didn’t just throw a missile at us...”

Sengupta: “Maybe they will now their big trip wire went

kaput.”

“We could use that,” Moore mused. “Rakshi, how much warning would we get if they fired on us?”

“Fired *what* you want the whole catalog?”

“Standard ass-cracker. Ballpark’s fine.”

She wiggled her fingers, for all the world as if she were counting on them. “Seven hours eight minutes if the range doesn’t change. Give or take.”

“Then we better get started,” Moore said.

“That is easily the most unenlightening briefing I have ever attended,” Brüks grumbled, pulling himself back into the southern hemisphere. “And given the number of departmental committees I sit on, that’s saying something.”

“Yeah, I kind of got that.” Lianna looked back from a bulkhead handhold. “Come with me. Got something that might help.”

She turned like a fish and sailed through the nearest spokeway. The very sight made Brüks a bit queasy. He followed at his own awkward pace, back through the cube-infested southern hemisphere, into the ball-and-socket that had swallowed her. Lianna dropped easily ahead of him, fending off Coriolis with a push and a kick; she was ten meters down the spoke before she even grabbed a hoop. Fuck *those* acrobatics: Brüks grabbed his own hoop right off the top, swung around and fumbled his foot into another before he weighed more than a couple of kilograms. He couldn’t be bothered to work out the acceleration of free-falling bodies that gained weight with each meter, but down the length of the spoke he was pretty sure they all ended in *splat*.

Commons. Another hab identical to those he kept escaping: a two-level propane tank from his grandfather’s backyard barbecue, grown monstrous and pumped full of stale air. The upper level, at least, was less crowded than Maintenance & Repair: chairs, privacy screens, a half-dozen half-emptied cubes, a table. The usual bands of epiphytic astroturf. A framework of

pencil-thin scaffolding extended from one wall. The facets of a personal tent—bone yellow, tough as tendons—stretched like latex between those vertices. A couple of sticky chairs faced each other amid the clutter.

Lianna was over by the fabber, rummaging through a freshly popped cube. “Got it.”

The cowl she held up looked a little like a bondage hood for plumbing fetishists, studded with washers and tiny screws that traced a fine grid across the skull. It left only the lower face exposed: mouth, jaw, the tip of the nose. Two especially prominent washers sat embedded over the eyes.

Ambient superconductors. Compressed-ultrasound pingers. A read-write voxel array in black leather.

“My old gaming mask,” Lianna announced. “I thought you could use an interface a little more user-friendly than Rakshi tends to be.”

A gimp hood, for cripples confined to meatspace.

“I mean, since you don’t have the imp—”

“Thanks,” Brüks said. “I think I’ll stick with the smart paint if it’s all the same to you.”

“It’s not just for gaming,” Lianna assured him. “It’s perfectly transparent for ConSensus, and it’s way faster than going through the paint. Plus it’ll triple your assimilation rate over anything filtered through the senses. Perfect for porn. Whatever you like.” She closed the cube. “There’s really not much of anything it can’t do.”

He took it from her. The material felt faintly oily in his hands. He turned it over, read the little logo that hovered a virtual centimeter off its surface: INTERLOPER ACCESSORIES.

“It’s completely noninvasive,” Lianna told him. “All TMS and compressed ultrasound, even the opt—”

“I’m familiar with the tech,” he told her. And then: “Thanks.”

“And you know, if you ever *are* in the mood for gaming, I’m happy to buddy up.”

No mention of his helplessness at Valerie’s hands. No mention of his panic attack. No impatience with his ignorance, no condescension over his lack of augments. Just an overture

and a helping hand.

Brüks tasted a mixture of shame and gratitude. *I like this woman*, he thought.

“Thanks,” he said again, because he didn’t know anything else that fit.

She flashed a goofy smile—“Anytime”—and pointed to something past his shoulder. “I think Jim wanted a word, right?”

Brüks turned. Moore had dropped soundlessly onto the deck behind him. Now he stood there looking vaguely apologetic, the websack on his back bulging with curves and odd angles.

“Should I—”

“I gotta get back to the Hold anyway. He’s all yours.” Lianna vanished into the ceiling with a jump and a grab while Moore shrugged the sack off his shoulders and split the seal. Brüks watched him withdraw a roll of the same kind of webbing.

Moore held it out. “For humping gear.”

Brüks took it after a moment—“Thanks. Don’t seem to have brought much gear with me”—but the Colonel was already back in his rucksack. This time he extracted a long green bottle, turned it in his hands so Brüks could see the label: *Glenmorangie*.

“Found it in one of the cubes,” he said. “Don’t ask me how it got there. Maybe it was some kind of retailer’s bonus for a big order. Maybe Chinedum just wanted to give me a doggie treat. All I know is, it’s a personal favorite—”

He set it on the deck, reached back into the sack.

“—and it came with a nice set of glasses.”

He gestured to the sticky chairs. “Pull up a seat.”

Moore cracked the bottle; the smell of peat and wood smoke swirled in the air. “Technically we shouldn’t be playing with open liquids even at one-third gee, but squeezebulbs make everything taste like plastic.”

Brüks held out his glass.

“If I had to guess”—Moore let a wobbling, low-gravity dram

escape from the bottle—"I'd say you're feeling a bit pissed off."

"Maybe," Brüks admitted. "When I'm not crapping my pants with existential terror."

"One day you're minding your own business on your camping trip—"

"Field research."

"—the next you're in the crossfire of a Tran war, the day after *that* you wake up on a spaceship with a bull's-eye painted on its hull."

"I do wonder what I'm doing here. Every thirty seconds or so."

They clinked and swallowed. Brüks grunted appreciatively as the liquid set the back of his throat to smoldering.

"There's a risk in being here, certainly," Moore admitted. "And for that I apologize. On the other hand, if we hadn't taken you with us you'd most likely be dead already."

"Do we even know who's chasing us?"

"Not with any certainty. Could be any number of parties. Even cavemen." The Colonel sipped his drink. "Sometimes Lianna doesn't give us enough credit."

"But why?" A thought occurred to him: "The hive didn't *steal* this thing, did they?"

Moore chuckled. "Do you know how many basic patents the Order has its name on? They could probably buy a fleet of these ships out of petty cash if they wanted to."

"Then why? "

"The hive was classified as a threat—rightly—even when it was stuck in a desert at the bottom of the well. Now we're on a ship that can take us anywhere from Icarus to the O'Neils." He regarded his scotch. "The threat level isn't going anywhere but up."

"That where we're going? Icarus?"

Moore nodded. "I don't think our tail knows that yet. For all they know we could be cutting across the innersys on our way somewhere else. Probably why they've held back as long as they have." He drained his glass. "*Why's* a sticky word, though. It's not especially productive to think of them as agents with

agendas. Better to think of them as—as very complex interacting systems, just doing what systems do. Whatever the reagents tell themselves to explain their role in the reaction, it's not likely to have much to do with the actual chemistry."

Brüks looked at the other man with new eyes. "You some kind of Buddhist, Jim?"

"A Buddhist soldier." Moore smiled and refilled their glasses. "I like that."

"Was Icarus part of—the magnifying glass?"

"Not likely. Can't rule it out, though. It's in the confidence zone."

"So why are we going there?"

"There's that word again." Moore set his glass down on the nearest cube. "Recon, basically."

"Recon."

"The Bicamerals would think of it as more of a—a pilgrimage, I suppose." His mouth tightened at one corner: a small lopsided grimace. "You remember the *Theseus* mission."

It was too rhetorical for a question mark. "Of course."

"You know the fueling technology it used—uses."

Brüks shrugged. "Icarus cracks the antimatter, lasers out the quantum specs, *Theseus* stamps them onto its own stockpiles, boom. All the antiprotons you can eat."

"Close enough. What matters is that Icarus has been beaming fuel specs up to *Theseus*'s telematter drive for over a decade now. And lately there's been some suggestion that something else has been coming *down* along the same beam."

"Wouldn't you expect them to send back samples?"

"*Theseus*'s fab channel went to a quarantine facility in LEO. I'm talking about the actual telematter stream."

"I didn't know that was even possible," Brüks said.

"Oh, it's quite possible. It was part of the design, in fact; fuel up, data down. Of course, the state of the art's still light-years away from being able to handle complex structure, the receiver's for—very basic stuff. Individual particles, exotic matter, nonbaryonic even. Stuff that might take a *lot* of energy to build."

Brüks sipped and swallowed. “What the hell were you expecting to find out there?”

“We had no idea.” Moore shrugged. “Something alien, obviously. And the cost of sticking a condenser on the sun side was negligible next to the mission as a whole. At the very least they could use it for semaphore if the main channel went down. So they stuck one in. In case it proved useful.”

“Which I’m guessing it did,” Brüks said.

Moore eyed the empty glass at his side, as if weighing the wisdom of having set it down. After a moment he reached for the bottle.

“Here’s the thing,” he said, refilling his glass. “*Theseus* got—decoyed *en route*, did you know that? Did they ever make that public?”

Brüks shook his head. “There was something about course corrections out past Jupiter, new and better data coming down the pike.”

“I can never keep it straight anymore,” Moore growled. “What we’ve admitted, what we’ve massaged, what we’ve covered up completely. But yes. After Firefall we were all staring at the sky so hard our eyeballs bled. Found something beeping out in the Kuiper Belt—that much you know—sent a squad of high-gee probes to check it out. Sent *Theseus* afterward, soon as we could slap her together. But she never made it that far. The probes got there first, caught a glimpse of something buried in a comet just before it blew up. All that way to get suckered by a—a decoy, as far as anyone could tell. Glorified land mine with a squawk box bolted on top. So we went back to our radio maps and our star charts and we found an X-ray spike buried in the archives, years before Firefall and never repeated. IAU called it an instrument glitch at the time but now it’s all we’ve got to go on. *Theseus* is already fifteen AUs out and headed the wrong way but you know, that’s the great thing about an unlimited fuel supply. We feed her a new course and she spins around and heads into the Oort and she finds something out there, tiny brown dwarf it looks like. She goes in for a look, finds something in orbit, starts to send back

details, and *pfsst*—”

He splayed the fingers of his free hand, brought them together at the tips, spread them again as if blowing out a candle.

“—gone.”

“I didn’t know that,” Brüks said after a while.

“I’d be worried if you did.”

“I thought the mission was still en route. Nothing on any of the feeds about finding anything.” Brüks eyed his own glass.

“So, what was it?”

“We don’t know.”

“But if they’d started sending—”

“Multiple contacts. Thousands. There was some evidence they might have been seeding the dwarf’s atmosphere with prebiotic organics—some kind of superjovian terraforming project, perhaps—but if they ever followed that up we never heard about it.”

“Jesus,” Brüks whispered.

“Maybe something else in there, too,” Moore added, staring at the deck. Staring through it. Staring all the way out to the Oort itself. “Something—hidden. Nothing definitive.”

He didn’t seem to be entirely in the room. Brüks softly cleared his throat.

Moore blinked and came back. “That’s all we know, really. The telemetry was noisy at best—that dwarf has one mother of a magnetic field, shouts over anything you try to send out. The Bicamerals have some amazing extraction algorithms, they were squeezing data out of clips I swore were nothing but static. But there are limits. *Theseus* went in and it was like, like watching a ship vanish into a fog bank. For all we know she could still be sending—they left a relay sat behind at least. It’s still active. As long as there’s hope, we’ll keep the feed going. But we’re not getting anything back from the ship itself. Can’t even get a signal through that soup.”

“Except you’re getting a signal right now, you said. Coming in along—”

“No.” Moore held up his hand. “If the system was operating

normally we'd have *seen* it operating, and we didn't. No handshaking protocols, no explicit transmissions, nobody from *up there* telling us they were sending something *down here*. None of the usual bells that are supposed to go off when a package arrives. At most we got a little hiccup that suggests that something might have *started* coming down, but the checksums didn't pass muster so move along folks, nothing to see here. Mission Control didn't even notice it. *I* didn't notice it. Wasn't until the Bicamerals helped me squeeze the archives through their born-again algorithms that I clued in, years after the fact."

"But if the stream isn't even running its own protocols, how can it be—"

"Ask them." Moore jerked his chin toward a vague point beyond the bulkhead, some nexus of Bicameral insight. "I'm just along for the ride."

"So, something's using our telematter stream," Brüks said.

"Or was, at least."

"And it's not us."

"And whatever it is, it's gone to great lengths to stay off the 'scope."

"What would it be sending?"

"*The Angels of the Asteroids*." Moore shrugged. "That's what the Bicamerals are calling it, or at least that's our closest approximation. Probably just their idea of an op code. But I don't know if they really think *anything's* down there. Maybe it's just a glitch after all. Or some kind of long-distance hack that didn't work out, and we can learn something about the hackers by studying their footprints."

"Suppose there *is* something down there, though," Brüks said. "Something—physical."

Moore spread his hands. "Like what? A clandestine mist of dissociated atoms?"

"I don't know. Something that breaks the rules."

"Well," Moore said, "in that case, I suppose..."

He took a breath.

"It's had a few years to settle in."

THINGS FALL APART.

—WILLIAM BUTLER YEATS

THEY'D COME UP with this really great plan to keep their mysterious pursuers from blowing up the *Crown*: they were going to blow it up themselves first.

They hadn't asked Brüks for his input.

Now he was back in Maintenance & Repair, taping himself up with another rubbery exoskeleton. It was easy enough to lay down the bands; all he had to do was follow the denuded template he'd stripped into existence less than two days before.

Of course, by now there were no *days* left to while away. Judging by the chime that had just sounded, he only had about two minutes to burn.

Two minutes to *burn*.

Lianna dropped out of the ceiling. "Hey. Just so you know, Rak's about ready to fold down the spokes. Didn't want you falling over when the gravity shifted."

Yeah, always concerned about the roaches, Brüks reflected wryly. *That sounds just like Rakshi Sengupta*.

On cue, the bulkheads shivered. The hab trembled with the sudden faint roar of a distant ocean. A squeezebulb rolled a few centimeters along the cube where someone had left it.

Brüks swallowed. His knitting ankle itched maddeningly. He resisted the urge to scratch; it wouldn't help anyway, not through the cast.

"Nothing to worry about," Lianna assured him. "Right-side up goes out of whack by a couple of degrees for a couple of minutes. Not even enough to spill your drink. If you were drinking."

He wished he was.

Down edged out from between his feet like a lazy pendulum, came to rest half a meter off his centerline: the *Crown's* hollow bones folding back along the spine like the ribs of a closing umbrella, the spin that threw them *out* slowing in a precise and delicate handoff to acceleration building from *behind*. All those

thousands of tonnes in slow motion, all those vectors playing one against another, and Brüks could feel nothing but a brief polite disagreement between his inner ears. Even now, *down* was edging back to where it belonged.

It really was pretty impressive, he decided. Still: "It's not the burn that bothers me. It's the coma afterward."

"You won't even feel it."

"That's what I mean. If I'm going to fall into the sun I'd at least like to be awake enough to jump into an escape pod if things go south."

"Then you've got nothing to worry about. No escape pods."

The hab jumped a bit, to the solid omnipresent *thud* of great docking clamps snapping shut. The 'bulb on the table wobbled back and forth. The *Crown of Thorns*, tied down and rigged for sail.

She tossed him his jumpsuit, pointed to the ceiling. "Shall we go?"

No effortless sail through a tunnel of light this time. No easing ascent from pseudograv into free fall. The *Crown* was on fire now, engines alight, habs flattened back against her flanks; there was no escape from mass-times-acceleration. Every rung ascended left him as heavy as the last, each hoop of hazard tape left him with that much farther to fall.

For some reason he couldn't identify, that almost made it easier.

They emerged into the Hub, into the bottom of a bowl: a place as gravity-bound now as any other on the ship. The great iris at the south pole was fixed and dilated. Needles of mercury drooled from the mirrorball above like strings of gluey saliva, descending through the open pupil. Freight elevator, apparently. To the Hold, and maybe beyond: to cubbies and crawlspaces where circuits could be wrestled manually in the event of some catastrophic systems failure; to the colossal neutron-spewing engines themselves.

Brüks edged forward and leaned over the railing. The depths of the *Crown's* hollow spine receded like an optical illusion, like God's own trachea. (Only a hundred meters, Brüks reminded

himself. *Only*. A hundred meters.) Signs of activity down there: flickers of motion, the faint clank of metal on metal. Liquid mirror-ropes vibrating like bowstrings in response to whatever tugged at their ends.

He jumped at a touch on his shoulder. Lianna held two lengths of silver cord in her hand; a stirrup had miraculously opened at the end of each, like hypertrophic needle's eyes. She handed him one line, pointed her foot through the loop in the other. "Grab and jump," she said, stepping lightly onto the guardrail.

She dropped away in slow motion—under a quarter-gee burn they weighed even less than under spin—and picked up speed with distance. Brüks hooked his own foot, grabbed his line with one hand (like wrapping your fingers around glassy rubber), and followed her down. The filament stretched and thinned in his grip as he descended. He raised his eyes and thought he might have glimpsed tiny shock waves rippling out from the point at which this miracle cord extruded from the mirrorball's surface; but speed and distance robbed him of a second look.

He dropped into pastel twilight, past biosteel struts and annular hoops and padded iridescent bulkheads. Conduit bundles lined the throat like vocal cords; silvery metal streams blurred in passing. The end of Lianna's discarded line snapped past going the other way, recoiling back up the shaft like a frog's tongue.

Only a quarter gee. Still dead easy to break your neck at the bottom of a hundred meters.

But Brüks's descent was slowing now, his miracle bungee cord stretching to its limits. Another great hatch yawned just below, flanked by grilles and service panels and a half-dozen spacesuit alcoves. An airlock puckered the bulkhead to one side like a secondary mouth, big enough to swallow two of him whole. It was the larger mouth that took him, though. The silver cord lowered him through like a mother putting her baby to bed, dropped him gently from light into darkness. It set him down on the floor of a great dim cavern where monsters and machinery loomed on all sides, and abandoned him there.

So this is strategy, Brüks mused. This is foresight, these are countermeasures. This is intellect so vast it won't even fit into language.

This is suicide.

"Have faith," Lianna had said drily as they'd climbed into their suits. "They know what they're doing."

The spacesuit wrapped around him like an asphyxiating parasite. His breath and his blood rasped loud in his helmet; the nozzle up his ass twitched like a feeding proboscis. He couldn't feel the catheter in his urethra, which in a way was even worse; he had no way of knowing what it was doing in there.

They know what they're doing.

They'd spent the past two hours in the Hold, lurking among the dim tangled shadows of dismembered machine parts while the rest of the ship froze down above them: habs, labs, spines and Hub all pumped dry and opened to vacuum. Until a few hours ago this cavernous space had been the exclusive domain of the afflicted Bicamerals, an improvised hyperbaric chamber where enemy anaerobes withered in poisonous oxygen, where the hive could lick their wounds and incant whatever spells they used to assemble the pieces of the puzzle they were building. Now all that arcane protomachinery was stacked and stored and strapped high against the walls. The Bicamerals, their tissues still saturated under the weight of fifteen atmospheres, had retreated into glass sarcophagi: personal decompression chambers with arms and legs. They stood arrayed on the deck like the opposite of deep-sea divers from a bygone age, barely mobile. Valerie's zombies moved silently among them, apparently charged with their care. Grubs tended by drones.

Now the Hold itself was freezing down, the *Crown's* last pocket of atmosphere thinning around the assembled personnel. Bicamerals, baselines, monsters—those interstitial, indeterminate things who might be a little of each—they all stood watching as the flaccid pile of fabric in the center of the chamber unfolded into a great black sphere, some interlocking geodesic frame pushing out from under its skin like an

extending origami skeleton. The hatching of a shadow.

Moore had called it a *thermos*. Watching it inflate, Brüks was almost certain it was the same giant soccer ball that had carried them from the desert. New paint job, though.

Lianna bumped him from the side, touched helmets for a private word: “Welcome to the Prineville class reunion.” Brüks managed a smile in return.

They know what they’re doing.

Brüks did, too, after a fashion. They were going to fall sideways. They were going to tumble past the exhaust, almost close enough to reach out and see your own arm vaporizing in a torrent of plasma blasting past at twenty-five kilometers per second. No option to fire maneuvering thrusters for a bit of extra forward momentum, no chance of putting a little distance between this soon-to-be-broken spine and the rapture of a half-dozen fusion bombs per minute. Newton’s First was a real bitch, not open to negotiation. Not even the Bicamerals could get her to spread her legs more than a crack, and even that grudging concession would be barely enough to mask the loss of their front end. There would be nothing left over for safe-distancing maneuvers.

And of course, if they didn’t miscalculate by a micron or two—if this little sprig of struts and scaffolding didn’t just get sucked into the wake and shredded to ions—well, maybe the barrage of neutrons sleeting out in all directions might be able to find a way in.

Rakshi Sengupta reached up and popped the thermos’s hatch. It sprang open and bumped back against the curve of the sphere, pneumatic and bouncy. Sengupta climbed up and in. Valerie’s automatons—even more interchangeable now, thanks to limited wardrobe options in the survival-gear department—formed a line and began passing the Bicamerals into that globe like worker ants carrying endangered eggs to safety.

All aboard, Lianna mouthed from behind her faceplate.

It wasn’t just the radiance of the drive that would give them away. Even the heatprint of minimal life support would shine like a beacon against a cosmic background that barely edged

above absolute zero. There were ways around that, of course. You don't notice a candle held up against the sun, and the *Crown of Thorns* had been keeping itself line of sight between Sol's edge and any pursuing telescopes: close enough to bury her heatprint in solar glare, not so close that she'd show up the moment someone threw an occlusion filter in front of their scanner. Another approach was to keep any warm bodies nested inside so much insulation that they'd be outside any reasonable search radius by the time their heatprint made it to the surface.

The Bicamerals didn't like to take chances. They were doing both.

It was the same soccer ball all right.

Same webbing inside. Same ambience—*Victorian Whorehouse Red*, he thought with a grimace—shadows and wavelengths long enough to make even a corpse look pretty. Same company, with edits.

A clutch of umbilicals hung from an overhead plexus and spread throughout the webbing. Brüks grabbed the nearest and locked it into his helmet's octopus socket. Lianna reached down from overhead, double-checked the connection, gave him a thumbs-up. Brüks sacc'ed comm and whispered a thank-you over the chorus of quiet breathing that flooded his helmet. Lianna smiled back behind tinted glass.

Moore climbed into the womb and sealed the hatch as the longwave dimmed around them. By the last of the light Brüks saw the soldier reach for his own umbilical. Then darkness swallowed them all.

Valerie was in here, too, hidden inside one of these mercurial disguises. Brüks hadn't seen her enter—hadn't even seen her on the deck—but then again, she could do that. She had to be in here somewhere, maybe in that suit, or that one over there.

He eyed the countdown on his HUD: two minutes now. One fifty-nine.

He yawned.

They'd told him it would be easier this time. No seat-of-the-

pants improvising, no panic-inducing suffocation. Just a breeze of fresh, cool anesthetic gas wafting through the helmet reg, putting him gently to sleep before the H₂S strangled his very cells from the inside.

They know what they're doing.

Fifty-five seconds.

An icon winked into existence next to the countdown: external camera booting up. Brüks blinked at it and—

“Let there be light,” Lianna whispered over the channel, and there was light: a blinding yellow sun, the size of Brüks’s fist held at arm’s length, blazing in a black sky. Brüks squinted up against the glare: a jagged sunlit tangle of beams and parallelograms hung overhead, sliced along a dozen angles by sharp-edged fissures of shadow.

Let there be a little less light, he amended, dialing back the brightness. The sun dimmed; the stars came out. They filled the void on all sides, a million bright motes that only managed to accentuate the infinite blackness between them. They disappeared directly overhead, eclipsed where the habs and girders of the *Crown* loomed like a junkyard in the sky. The sun turned the ship’s lit edges into a bright jigsaw; the rest was visible only by inference, a haphazard geometry of negative space against the stars.

The sky lurched.

Here we go...

Another lurch. A sense of slow momentum, building. Somewhere behind them, the ligaments that held the *Crown* together were burning through. Up ahead, the view listed to port.

They know what they're doing.

The bow of the ship began to topple, slow and majestic as a falling redwood. Sunlight and shadow played across its facets, hiding and highlighting myriad angles as the stars arced past. The universe turned around them. The sun rose, reached zenith, fell.

Something glowed to stern, a corona peeking around a great black shape that blocked out the stars to stern: something

finally tilting into view as a dozen insignificant rags of metal snapped and fell away. Brüks caught the briefest glimpse of dark mass, massive slabs of shielding, a great corrugated trunk thick as a skyscraper—

(*Shock absorbers*, he realized.)

—before a tsunami of white light struck him instantly, rapturously blind.

Floaters swarmed through his eyeballs like schools of panicked fish. Brüks blinked away tears, reflexively reached up, felt that strange, newly familiar inertia return to his arms—

—*Free fall*—

—before the sticky mesh released them to let his gloved hands swipe clumsily at his faceplate. He missed; his arms flailed, encountering nothing but the elastic bounce of the gee-web.

He wobbled gently, weightless, waiting for his vision to clear. By the time he could see again the panorama had been usurped by mere telemetry: an impoverished wraparound of numbers and contour plots and parabolic trajectories. Brüks squinted, tried to squeeze signal from noise through the cotton growing in his head: the *Crown's* drive section was already kilometers to port and kilometers ahead, its lead increasing with each second per second. Tactical had laid a vast attenuate cone of light across the space before it, spreading from the abandoned drive like a searchlight. *Ramscoop*, Brüks realized after a second. A magnetic field to gather up ionized particles, a brake against the solar wind. A proxy for mass gone suddenly missing: no telltale change in acceleration, no suspicious easing back on the throttle. One measure among many, shoehorned in between the masking of heatprints and whatever stealthed this ship to radar. Moore had told him as much as he could understand, Brüks supposed. There would be more. Solutions to problems no baseline could even foresee, let alone solve. A careful clandestine exit stage left, while unwitting pursuers followed a bright burning decoy toward the land of the comets. All spread out across the curve of his own personal diving bell, numbers and diagrams and stick-figure animations for the retarded.

He only understood half of it, and didn't know if he could trust the other half.

Maybe it's not even real, he thought drowsily. *Maybe it's all just a comforting fantasy to keep me pacified in the backseat. Mommy and Daddy, telling nice stories to keep the children from crying.*

They were still alive, at least. The exhaust hadn't vaporized them outright. Only time would tell if radiation sickness might. Time, or—

He cast his eyes around the bubble of intel. He saw nothing that spoke obviously to the subject of gamma rays.

It would take a while, of course. You wouldn't feel anything at first, certainly not in the few minutes left before everyone went down for the...night...

Fifty days to Icarus. Fifty days tumbling ass-over-entrails, powered down, ballistic, just another piece of inner system junk. Needle in a haystack, maybe, but nowhere near sharp enough to prick anyone who happens to look this way. Lots of time for those bright little shards to rot us out from the inside. We could die in our sleep and never know it.

His eyelids felt incongruously heavy in the weightless compartment. He kept them open, peered around at all those faces under glass, looked for smiles or frowns or any telltale wrinkles of worry that might be creasing more-enlightened foreheads. Angles and optics turned half the helmets into warped mirrors, hiding the faces within. Some tiny part of Daniel Brüks furrowed its brow in confusion—*Wait a minute... aren't the lights supposed to be off?*—but somehow he could see Lianna, eyes already closed, her face smoothed either in sleep or resignation. He could see the back of Moore's helmet, down past his own boots. He was almost certain that he could make out a pair of Bicameral eyes here and there, all closed, the mouths beneath moving in some silent synchronized chant.

Nothing but breathing on comm.

Maybe I'm asleep already, he thought, twisting in the web. *Maybe I'm lucid.*

Valerie stared back at him. No trace of fatigue or anesthesia in that face.

No metabolic hacks for her, Brüks thought as his eyes began to close. No rotten stench in the back of her throat, no CO or H₂S clogging up her blood cells, no half-assed technology to keep her under. She doesn't need our help. She was doing this twenty thousand years ago, she'd mastered the undead arts before we'd even started scratching stick figures on cave walls. She gorged on us and then she just went away while we bred back to sustainable levels, while we forgot she was real, while we turned her from predator to myth, myth to bedtime story...

A bullet hole appeared in the center of her breastplate. A line, growing vertically: a crack splitting her suit down the middle.

All those years we took to convince ourselves she didn't really exist after all, and all that time she was sleeping right under our feet. Right up until she got hungry again, and dug herself out of the dirt like some monstrous godforsaken cicada, and went hunting while we put ourselves to sleep in our own graves and called it Heaven...

Valerie twisted and squirmed and emerged naked from her silvery cocoon: white as a grub, lean as a mantis. She grinned needles and clambered across the web toward him.

Like we're sleeping now, Brüks thought, fading. While she smiles at me.

I AM LARGE, I CONTAIN MULTITUDES.

—WALT WHITMAN

HE DESCENDED INTO Heaven's dungeon, but the shackles were empty and his wife was nowhere to be seen.

He lay on his back in the desert, looked down and saw that he'd been gutted, crotch to throat. Spectral snakes surged eagerly from the gash, fled the confines of his body for the endless baked mud of a fossil seabed, free at last, free at last...

He soared through an ocean of stars, dimensionless pinpoints:

abstract, unchanging, unreal. One of them broke the rules as he watched, a pixel unfolding into higher dimensions like some quantum flower blooming in time-lapse. Angles emerged from outlines; shadows stretched across surfaces turning on some axis Brüks couldn't quite make out. Bones spun majestically at its midsection.

Monsters in there, waiting for him.

He tried to veer off, to brake. He pulled all those temporoparietal strings that turned dreams lucid. The *Crown of Thorns* continued to swell in his sights, serenely untroubled by his pitiful attempts to rewrite the script. A hab swept toward him like the head of a mace; he flailed and thrashed and closed his eyes but felt no impact. When he looked again he was *inside*, and Valerie was staring back.

Welcome to Heaven, Cold Cut.

Her monster eyes were fully dilated; like headlights, like balls of bright bloody glass lit from within. The mouth beneath split open like a fresh grinning wound.

Go back to sleep, she told him. *Forget all your worries. Sleep forever.*

Her voice was suddenly, strangely androgynous.

It's your call.

He cried out—

—and opened his eyes.

Lianna leaned over him. Brüks raised his head, glanced frantically in all directions.

Nothing. No one but Lianna. They were back in Maintenance & Repair.

Better than Storage.

He settled back on the pallet. "I guess we made it?"

"Probably."

"Probably?" His throat was parched.

She handed him a squeezebulb. "We're where we're supposed to be," she said as he sucked like a starving newborn. "No obvious signs of pursuit. It'll take a while before we can be sure

but it's looking good. The drive blew up a few hours after we separated, so as far as we know they know, they got us."

"Whoever they are."

"Whoever they were."

"So. Next stop, Icarus?"

"Depends on you."

Brüks raised his eyebrows.

"I mean yes, we're going to Icarus. But you don't have to be up for it if you're not, you know, up for it. We could put you back under, next thing you know you're back on Earth safe and sound. Since you're not officially part of the expedition."

One mission-critical. One ballast.

"Or you put me back under and I die in my sleep when your expedition goes pear-shaped," he said after a moment.

She didn't deny it. "You can die in your sleep anywhere. Besides, the Bicams would know better than any of us, and they're pretty sure you'll make it back."

"They told you that, did they?"

"Not explicitly, but—yeah. I got that sense from them."

"If they really knew what they were going to find down there," Brüks mused, "they wouldn't have to go in the first place."

"There is that," she said. And then, more cheerfully: "But if the mission *does* go pear-shaped, wouldn't you rather die in your sleep than be wide awake and screaming when you get sucked into space?"

"You are the Queen of the Silver Lining," Brüks told her.

She bowed, and waited.

A trip to the sun. A chance to glimpse the traces of an alien intelligence—whatever *alien* meant in a world where members of his own species stitched themselves together into colony minds, or summoned their own worst nightmares back from the Pleistocene to run the stock market. The face of the unknown. What scientist would choose to sleep through that?

As if they'd ever let you get close to their precious Angel of the Asteroids, his inner companion sneered. *As if you'd be able to make any sense of it if they did. Better to sit it out, better to let them*

carry you back home so you can pick up your life where you dropped it. You don't belong out here anyway. You're a roach on a battlefield.

Who could easily get squashed in his sleep. What soldier in combat, no matter how benign, ever gave a thought to the vermin underfoot?

Awake, at least, he might be able to scuttle clear of descending boots.

"You think I'd pass up the chance to do *this* kind of fieldwork?" he said at last.

Lianna grinned. "Okay, then. You know the drill, I'll let you get yourself together." She took a bouncing step toward the ladder.

"Valerie," Brüks blurted out behind her.

She didn't turn. "In her hab. With her entourage."

"When the ship was breaking—I saw—"

She tilted her head, lowered her gaze to some point on the far bulkhead. "You see weird things when you go under, sometimes. Near-death experiences, you know?"

Too near. "This was no Tunnel of Light."

"Hardly ever is." Lianna reached for the railing. "Brain plays tricks when you turn it on and off. Can't trust your own perceptions."

She paused and turned, one hand on the ladder.

"Then again, when can you?"

Moore dropped unsmiling onto the deck as Brüks finished pulling on his jumpsuit. He held a personal tent in one hand, a rolled-up cylinder the size of his forearm. "I hear you'll be joining us."

"Try to control your enthusiasm."

"You're an extra variable," the Colonel told him. "I have a great deal of work to do. And we may not have the luxury of keeping an eye on you if things get sticky. On the other hand —" He shrugged. "I can't imagine deciding any differently, in your shoes."

Brüks raised his left foot, balanced on his right to scratch at his freshly pinkened ankle (someone had removed the cast during his latest coma). “Believe me, getting in the way’s the last thing I want to do, but this isn’t exactly familiar territory for me. I don’t really know the rules.”

“Just—stay out of the way, basically.” He tossed the tent to Brüks. “You can set up your rack pretty much anywhere you want. The habs are a bit messy—we had to relocate a lot of inventory when they converted the Hold—but we’ve also got fewer people living in them for the time being. So find a spot, set up your tent, buckle down. If you need something and the interface can’t help you, ask Lianna. Or me, if I’m not too busy. The Bicamerals will be coming out of decompression in a few days; try to keep out from underfoot. Needless to say that goes double for the vampire.”

“What if the vampire *wants* me underfoot?”

Moore shook his head. “That’s not likely.”

“She already went out of her way to—to provoke me...”

“How, exactly?”

“You see her arm, after the spoke broke?”

“I did not.”

“She broke it. She broke her own fucking arm. Repeatedly. Said I wasn’t setting it right.”

“But she didn’t attack you. Or threaten you.”

“Not physically. She really seemed to get off on scaring the shit out of me, though.”

The Colonel grunted. “In my experience, those things don’t have to *try* to scare the shit out of anyone. If she wanted you dead or broken, you would be. Vampires have—idiomatic speech patterns. You may have simply misunderstood her.”

“She called me a *cold cut*.”

“And Rakshi Sengupta called you a *roach*. Unless I miss my guess you took that as an insult, too.”

“Wasn’t it?”

“Common Tran term. Means so primitive you’re unkillable.”

“I’m plenty killable,” Brüks said.

“Sure, if someone drops a piano on your head. But you’re also

field-tested. We've had millions of years to get things right; some of those folks in the Hold are packing augments that didn't even exist a few *months* ago. First releases can be buggy, and it takes time for the bugs to shake out—and by then, there's probably another upgrade they can't afford to pass up if they want to stay current. So they suffer—glitches, sometimes. If anything, *roach* connotes a bit of envy."

Brüks digested that. "Well, if it was supposed to be some kind of compliment, her delivery needs work. You'd think someone with all that brainpower would be able to cobble together a few social skills."

"Funny thing"—Moore's voice was expressionless—"Sengupta couldn't figure out how someone with all your interpersonal skills could be so shitty at math."

Brüks said nothing.

"Don't take this personally," the Colonel told him, "but try to keep in mind that we're guests on this ship and your personal standards—whatever they might be—do not reign supreme here. Dogs are always going to come up short if you insist on defining them as a weird kind of cat. These people are not baselines with a tweak here and there. They're closer to, to separate cognitive subspecies. As far as Valerie goes, she and her—bodyguards—have pretty much stayed in their hab since the trip began. I expect that to continue. She finds the ambient lighting too bright, for one thing. I doubt you'll have trouble as long as you don't go looking for any."

Brüks felt his mouth tighten at the corners. "So"—remembering the briefing in the Hub, in the company of the *envious* Rakshi Sengupta—"a week to Icarus?"

"Closer to twelve days," Moore told him.

"Why so long?"

Moore looked grim. "That fiasco at the monastery. The *Crown* had to launch prematurely. The sep maneuver was always part of the plan—doesn't take a hive to know a trip like this is going to draw attention—but the replacement drive's still in pieces. They're putting it together as we speak."

Brüks blinked. "We've got no engines at *all*?"

“Maneuvering thrusters. Can’t use them yet, not without risking detection.” Moore saw the look on Brüks’s face, added: “Not that I expect we’ll need them in any event. The hive’s ballistic calculations are *very* accurate. And it’s just as well we’re taking the long way, given the medical situation. The bug was easy enough to fix once they nailed down its specs, but healing takes time and hibernation’s not the same thing as a medical coma. Last thing we want is to hit the zone with our core personnel compromised.” Moore’s face hardened at some grim insight, relaxed again. “My advice? Look on this as an extended sabbatical. Maybe you get a ringside seat to some amazing discoveries; maybe it’s a dead end and you’ll be bored out of your skull. Either way, you can weigh it against a painful death in the Oregon desert and call it a win on points.” He spread his hands. “Here endeth the lesson.”

The lights had been dimmed in the northern hemisphere. Climbing into the Hub, Brüks could see a wash of arcane tacticals through the equatorial grille, a chromatic mishmash he knew would make no sense even with an unobstructed view.

“Wrong way,” said a familiar voice as he headed for the next spoke.

Sengupta.

“What?”

He couldn’t see her, even through the grille; the mirrorball eclipsed the view. But her voice carried clearly around the chamber: “You visiting the vampire?”

“Uh, no.” *God* no.

“Then you’re going the wrong way.”

“Thanks.” He second-guessed himself, decided to risk it (hey, *she’d* started the conversation), swam through the air, and bull’s-eyed the doorway more through luck than skill.

She was still embedded in her acceleration couch. Her face turned away as soon as he came into view.

She kept up her end, though. “Where you going?”

I don’t know. I don’t have a clue. “Commons. Galley.”

“Other way. Two spokes over.”

“Thanks.”

She said nothing. Her eyes jiggled in their sockets. Every now and then a ruby highlight winked off her cornea as some unseen laser read commands there.

“Meatspace display,” Brüks tried after a moment.

“What about it?”

“I thought everyone here used ConSensus.”

“This is ConSensus.”

He tapped his temple. “I mean, you know. Cortical.”

“Wireless can bite my clit *anyone* can peek.”

The fruit of her labor sprawled across a good twenty degrees of the dome, a light storm of numbers and images and—over on the far left side—a stack of something that looked like voiceprints. It didn’t look like any kind of astrogation display Brüks had ever seen.

She was spelunking the cache.

“I can peek,” he said. “I’m peeking right now.”

“Why should I care about *you*?” Sengupta snorted.

Cats and dogs, he thought, and held his tongue.

He tried again. “So I guess I’ve got you to thank for that?”

“Thank for what?”

He gestured at weeks-old echoes plastered across the sky. “Grabbing that snapshot on the way out. Don’t know what I’d do for the next twelve days if I didn’t have some kind of Quinternet access.”

“Sure why not. You’re eating our food you’re huffing our O₂ why not suck our data while you’re at it.”

I give up.

He turned and headed back to the exit. He felt Sengupta shift in the couch behind him.

“I *hate* that fucking vampire she moves all wrong.”

It was nice to know that basic predator-aversion subroutines survived the augments, Brüks reflected.

“And I wouldn’t trust Colonel Carnage either,” Sengupta added. “No matter how much he cozies up to you.”

He looked back. The pilot floated against the loose restraints

of her couch, unmoving, staring straight ahead.

“Why’s that?” Brüks asked.

“Trust him then do what you want. I don’t give a shit.”

He waited a moment longer. Sengupta sat as still as a stick insect.

“Thanks,” he said at last, and dropped through the floor.

So that’s what I am, then. A parasite.

He descended into the Lab.

Some half-dead fossil, scooped up in passing from the battlefield. Patched together for no better reason than the firing of a few mirror neurons, some vestigial itch we might have once called pity.

The equipment wasn’t his, but the workbench provided some degree of plastic comfort: a bit of surrogate familiarity in a ship too full of long bones and strange creatures.

Worse than ballast: I suck their O₂ and eat their supplies and take up precious airspace millions of clicks from the nearest real atmosphere. Less than a pet: they don’t want my company, feel no urge to scratch my ears, aren’t interested in any tricks I might know except staying invisible and playing dead.

Sequence/splicer, universal incubator, optoelectron nanoscope with a respectable thirty-picometer threshold. All reassuringly familiar in a world where he’d half expected the very dust to be built out of miracles and magic crystals. Maybe that was deliberate: a security blanket for strays who’d missed the Singularity.

Okay, then. I’m a parasite. Parasites are not destroyed by the powerful: parasites feed on them. Parasites use the powerful to their own ends.

The lower level was empty except for a short stack of folded chairs and half-dozen cargo cubes (fab-matter stockpiles, according to the manifest). Brüks unslung the tent and spread it across the deck against a curve of bulkhead.

A tapeworm may not be as smart as its host but that doesn’t stop it from scamming shelter and nourishment and a place to breed. Good parasites are invisible; the best are indispensable. Gut

bacteria, chloroplasts, mitochondria: all parasites, once. All invisible in the shadow of vaster beings. Now their hosts can't live without them.

The structure inflated into a kind of bulbous lozenge. It swelled igloolike toward the center of the compartment, molded itself against the walls and flooring behind. It wasn't too different from his abandoned tent back in the desert; the piezoelectricity that buttressed the structure also powered the GUI sheathing its inner surface. Brüks ran an index finger down the center of the door. Its membranous halves snapped gently apart like a sheet of mesentery split down the middle.

Some go even farther. Some get the upper hand, dig down, and change the wiring right at the synapse. Dicrocoelium, Sacculina, Toxoplasma. Brainless things, all of them. Mindless creatures that turn inconceivably greater intellects into puppets.

He dropped to his knees and crawled inside. The built-in hammock clung to the inner surface of the tent, ready to peel free and inflate at a touch. The default config only provided enough headroom for a crouch but Brüks couldn't be bothered to dial up the headroom. Besides, the tight confines were strangely comforting down here at the very bottom of the spoke, just a few layers of alloy and insulation from the whole starry drum of the heavens rolling past beneath his feet.

So I'm a parasite? Fine. It is an honorable title.

Down here, nestled in this warm and self-regulating little structure, he was as heavy as the *Crown* would let him be. He felt almost stable, almost rooted. And while he wouldn't quite call it *safety*, he almost managed not to notice how like a burrow his quarters were: how deep in the earth, how far removed from other inhabitants of this pocket ecosystem. And how Daniel Brüks huddled against the deck like a mouse squeezed into the farthest corner of a great glass terrarium full of cobras, the lights turned up as bright as they would go.

IF YOU ARE GIVEN A CHOICE, YOU BELIEVE YOU HAVE
ACTED FREELY.

—RAYMOND TELLER

EVERY HAB STARTED out like every other: same stand-alone life support, same snap-and-stretch frame guides to subdivide the living space to personal preference. Same basic bulkhead galley panel with a toilet on the other side. They all came with the same emergency hibe hookups, compatible with most popular pressure suits and long-distance coffins (not included). It was Boeing's most generic all-purpose personarium, plucked off the shelf, bought in bulk, stuck on the ends of the *Crown's* spokes on short notice. In the almost inconceivable event that one of those spokes should snap and send a hab tumbling off on its own, corporate guarantees ensured that the bodies therein would keep fresh and breathing (if inert) for up to a year or until atmospheric reentry, whichever came first.

Which was not to say that custom features were out of the question. The fabber in Commons could whip up food with actual taste.

Moore was the only other warm body in evidence when Brüks climbed down for breakfast. The Colonel didn't return the other man's smile at first—Brüks recognized the thousand-meter stare of the ConSensused—but the sound of Brüks's feet on the deck brought him back to the impoverished world of mere meatspace.

"Daniel," he said.

"Didn't mean to disturb you," Brüks said, which was a lie. He'd waited until the sparse constellations arrayed across the *Crown's* intercom had aligned just so—Lianna or Moore in the Commons, Valerie anywhere else—before venturing forth in search of forage.

Moore waved the apology away. "I could do with a break anyway."

Brüks told the fabber to print him up a plate of French toast and bacon. "Break from what?"

"*Theseus* telemetry," Moore told him. "What little there is of it. Brushing up for the main event."

"There's a main event? For *us*?"

"How do you mean?"

Brüks one-handed his meal to the Commons table (petroleum accents faintly adulterated the aroma of syrup and butter rising from the plate) and sat down. "Dwarves among giants, right? I didn't get the sense there'd be any kind of active role for mere baselines."

He tried a strip of bacon. Not bad.

"They have their reasons for being here," Moore said mildly. "I have mine." In a tone that said, *And they're not for sharing*.

"You deal with these guys a lot," Brüks guessed.

"These guys?"

"Bicams. Post-Humans."

"They're not post-Human. Not yet."

"How can you tell?" It was only half a joke.

"Because otherwise we wouldn't be able to talk to them at all."

Brüks swallowed a bolus of faux French toast. "They could talk to us. Some of them, anyway."

"Why would they bother? We're on the verge of losing them as it is. And—do you have children, Daniel?"

He shook his head. "You?"

"A son. Siri's not exactly baseline himself, actually. Nowhere near the far shore, but even so it's been difficult to—connect, sometimes. And maybe this comparison won't mean much to you, but—they're *all* our children, Humanity's children, and even now we can barely keep their interest. Once they tip over that edge..." He shrugged. "How long would it take *you* to decide you had better things to do than talk to a bunch of capuchins?"

"They're not gods," Brüks reminded him softly.

"Not yet."

"Not *ever*."

"That's denial."

"Better than genuflection."

Moore smiled, a bit ruefully. "Come on, Daniel. You know how powerful science can be. A thousand years to climb from ghosts and magic to technology; a day and a half from technology back up to ghosts and magic."

"I thought they didn't use *science*," Brüks said. "I thought that was the whole point."

Moore granted it with a small nod. "Either way, you put baselines against Bicamerals and the Bicamerals are going to be a hundred steps ahead every time."

"And you're comfortable with that."

"My comfort doesn't enter into it. Just the way it is."

"You seem so—fatalistic about it all." Brüks pushed his empty plate aside. "The far shore, the gulf between giants and capuchins."

"Not fatalism," Moore corrected him. "Faith."

Brüks glanced sharply across the table, trying to decide if Moore was yanking his chain. The soldier stared back impassively.

"The fact that something *shot* us," Brüks continued deliberately. "And you yourself said they're probably Tran."

"I did, didn't I?" Moore seemed to find that amusing. "Fortunately we've got a pretty good team of those in our own corner. Honestly, I wouldn't worry."

"You trust them too much," Brüks said quietly.

"So you keep saying. You don't know them the way I do."

"You think you know them? You're the one who called them *giants*. We don't know their agendas any more than we know what those smart clouds are up to. At least smart clouds don't open up your brain and dig around like, like..."

Moore didn't say anything for a moment. Then: "Lianna."

"You know what they did to her?"

"Not exactly."

"That's exactly my point. No one does. *Lianna* doesn't know. They shut her off for four days, and when she woke up she was some kind of Chinese Room savant. Who knows what they did to her brain? Who knows if she's the same person?"

"She's not," Moore said flatly. "Change the wiring, change

the machine.”

“That’s what I’m saying.”

“She agreed to it. She volunteered. She worked her ass off and elbowed her way to the front of the line just for the chance to make the cut.”

“It’s not informed consent.”

That raised eyebrow again. “How so?”

“How can it be, when the person giving it is cognitively incapable of understanding what she’s agreeing to?”

“So you’re saying she’s mentally incompetent,” Moore said.

“I’m saying we *all* are. Next to the hives, and the vampires, and the thumbwirers, and that whole—”

“We’re children.”

“Yes.”

“Who can’t be trusted to make our own decisions.”

Brüks shook his head. “Not about things like this, no.”

“We need adults to make those choices on our behalf.”

“We—” He fell silent.

Moore watched him above the ghost of a smile. After a moment he pulled the Glenmorangie off the wall.

“Have a drink,” he said. “Helps the future go down easier.”

. . .

Crawling unseen through the viscera of its host, the parasite takes control.

Daniel Brüks drilled into the central nervous system of the *Crown of Thorns* and bent it to his will. Lianna, as usual, was back in the Hold with her helpless omnipotent masters. Sengupta’s icon glowed in the Hub. Moore was ostensibly in the Dorm but the feed from that hab put the lie to it: only his body was there, running on autopilot while his closed eyes danced through some ConSensual realm Brüks could only imagine.

He was going to be eating alone.

The anxiety had become chronic by now. It nagged at the bottom of his brain like a toothache, had become so much a

part of him that it went unnoticed save for those times when some unexpected chill brought it all back. Panic attacks: in the spokes, in the habs, in his own goddamn tent. They didn't happen often, and they never lasted long. Just often enough to remind him. Just long enough to keep him paranoid.

The blade began to twist as he ascended the spoke. Brüks gritted his teeth, briefly closed his eyes as the conveyor pulled him past the Zone of Terror (it helped, really it did), relaxed as the haunted zone receded beneath him. He released the handhold at the top of the spoke and coasted into the Hub, crossed the antarctic hatch (half-contracted now, barely wide enough for the passage of a body) pushed himself toward—

A soft wet sound. A cough from the northern hemisphere, a broken breath.

Someone crying.

Sengupta was up there. Had been a few minutes ago, at least.

He cleared his throat. "Hello?"

A brief rustle. Silence and ventilators.

Ohhkay...

He resumed his course, crossed to the Commons spoke, twisted and jackknifed through. He allowed himself a moment of self-congratulation as he grabbed the conveyor and started down headfirst, smoothly swinging around the handhold until his feet pointed down; just two days ago all these drainpipes and variable-gravity straightaways would have left him completely disoriented.

Valerie tagged him halfway.

He never saw her coming. He had his face to the bulkhead. There may have been a flicker of overhead shadow, just a split second before that brief touch between his shoulder blades: like a knife's edge sliding along his spine, like being *unzipped* down the back. His back brain reacted before he was even aware of the contact, flattened and froze him like a startled rabbit. By the time he could move again she was past and gone and Daniel Brüks was still alive.

He looked down, down that long tunnel she'd sailed into headfirst and without a sound. She was waiting at the bottom

of the spoke: white and naked and almost skeletal. Wiry corded muscle stretched over bone. Her right foot tapped a strange and disquieting pattern on the metal.

The conveyor was delivering him into her arms.

He released the handhold, lunged across the spoke for the static safety of the ladder. He missed the first rung he grabbed for, caught the second; leftover momentum nearly popped his shoulder from its socket. His feet scrabbled for purchase, finally found it. He clung to the ladder as the conveyor streamed past to each side, going up going down.

Valerie looked up at him. He looked away.

She just touched me for Christ's sake. I barely even felt it. It was probably an accident.

No accident.

She hasn't threatened you, she hasn't raised a hand. She's just—sitting there. Waiting.

Not in her hab. Not kept at bay by bright lights, no matter what comforting lies Moore had recited.

Brüks kept his eyes on the bulkhead. He swore he could feel the baring of her teeth.

She's just another failed hominoid. That's all she is. Without our drugs she couldn't even handle a few right angles without going into convulsions. Just another one of nature's fuckups, just another extinct monster ten thousand years dead.

And brought back to life. And chillingly, completely at home in the future. More at home than Daniel Brüks had ever felt.

She wouldn't even be alive if it weren't for us. If we roaches hadn't scraped up all those leftover genes and spliced them back together again. She had her day. She's nothing to be afraid of. Don't be such a fucking coward.

“Coming?”

With effort he looked down, managed to fix his gaze on the edge of the hatch behind her, kept her eyes in that great comforting wash of low resolution that made up 95 percent of the human visual field. He even managed to answer, after a fashion: “I, um...”

His hands stayed locked on the ladder.

“Suit yourself,” Valerie said, and disappeared into the Commons.

Motion through the grille: the pixilated mosaic that was Rakshi Sengupta, returning from some place farther forward. The lav in the attic, perhaps. Brüks found it perfectly understandable that Sengupta might choose to leave for a piss at the same moment Valerie happened to be passing through.

She fell into eclipse behind the mirrorball. Brüks heard the sound of buckles and plugs clicking into place, a grunt that might have passed for a greeting: “Thought you were headed for Commons.”

He swam into the northern hemisphere. Sengupta was pulling a ConSensus glove over her left hand: middle finger, ring, index, little, thumb. Her hair stood out from her head, crackling faintly with static electricity.

“Valerie got there first,” he said.

“Room for two down there.” Right glove: middle, ring, index...

“There really isn’t.”

She still refused to look at him, of course. But the smile was encouraging.

“Nasty cunt doesn’t even *use* the galley.” Sengupta’s tone was conspiratorial. “Only comes out of her hab to scare us.”

“How’d she even end up here?” Brüks wondered.

Sengupta did something with her eyes, a little jiggle that said *command interface*. “There. Now we’ll see her coming.” Her elbows moved out from her body and back in, a precise stubby wingbeat. Brüks couldn’t tell whether it was interface or OCD. “Anyhow why ask me?”

“I thought you’d know.”

“You were *there* I just fished you all out of the atmosphere.”

“No, I mean—where’s she even *from*? Vampires are supposed to live in comfy little compounds where they fight algos and solve Big Problems and don’t threaten anybody. It’s not like anyone would be stupid enough to let them off the leash. So

how does Valerie show up in the desert with a pack of zombies and an army aerostat?"

"Smart little monsters," Sengupta said, too loud. (Brüks stole a nervous glance through the perforated deck.) "I'd start making *crosses* if I were you."

"No good. They've got those drug pumps in their heads. AntiEuclidean."

"Things *change*, baseline. Adapt or die." Sengupta's head bobbed like a bird's. "I don't know *where* she comes from. I'm working on it though. Don't trust her at *all* don't like the way she moves."

Neither do I, Brüks thought.

"Maybe her friends can tell us," Sengupta said.

"What friends?"

"The ones she got *away* from, I've been looking and—hey you're a big-time biologist right? You go to conferences and all?"

"One or two, maybe. I'm not *that* big-time." Mostly he just virtualized; his grants weren't big enough to let him jet his actual biomass around the planet.

Besides, these days most of his colleagues weren't all that happy to see him anyway.

"Shoulda gone to this one." Sengupta bit her lip and summoned a video archive onto the wall. It was a standard floatcam view of a typical meeting hall in a typical conference: she'd muted the sound but the sight was more than familiar. Seated rows of senior faculty decked out in thermochrome and conjoined flesh-sculpture; grad students dressed down in ties and blazers of dumbest synth. A little corral off to one side where a few dozen teleops stood like giant stick insects or chess pieces on treads, rented mechanical shells for the ghosts of those who couldn't afford the airfare.

The speaker of the hour stood behind the usual podium. The usual flatscreen stretched out behind him; the usual corporate hologram spun lazily above it all, reminding the assembled of where they were and whose generous sponsorship had made it all possible:

FizerPharm Presents
The 22nd Biennial J. Craig Ventor Memorial Conference on
Synthetic and Virtual Biology

“Not really my thing,” Brüks admitted. “I’m more into—”

“*There!*” Sengupta crowed, and froze the feed.

At first he couldn’t see what she was getting at. The man at the podium, petrified in midmotion, gestured at a matrix of head shots looming behind him on the screen. Just another one of those eye-glazing group dioramas that infested academic presentations the world over: *I’d like to take this opportunity to thank all those wonderful folks who assisted in this research because there’s no fucking way I’ll ever give them actual coauthorship.*

Then Brüks’s eyes focused, and his gut clenched a little.

Not collaborators, he saw: *subjects.*

He could tick off the telltales in his head, one by one: the pallor, the facial allometry, the angles of cheekbone and mandible. The eyes: Jesus Christ, those eyes. An image filtered through three generations, a picture of a picture of a picture, fractions of faces degraded down to a few dark pixels and they still sent cold tendrils up his spine.

All these things he could itemize, given time. But the brainstem chill shrank his balls endless milliseconds before his gray matter could have ever told him why.

The Uncanny Valley on steroids, he thought.

For the first time he noticed the text glowing on the front of the podium, the thumbnailed intel of a talk already in progress: *Paglino, R. J., Harvard—Evidence of Heuristic Image Processing in the Vampire Retina.*

Sengupta drummed her fingers, fed the roach a clue: “Second row third column.”

Valerie’s face. Oh yes.

“They make ’em hard to track,” she complained. “Keep changing ID codes move them around. All *proprietary information* and *filing errors* and *can’t let the vampire liberation front know where the kennels are* but I got her now I got her now I got the first piece of the puzzle.”

Valerie the vampire. Valerie the lab rat. Valerie the desert demon, mistress of the undead, scorched-earth army of one. Rakshi Sengupta *had* her.

“Good luck,” Brüks said.

But the pilot had already brought up another window, a list of names and affiliations. Authors and attendees, it looked like. Some were flagged. Brüks squinted at the list, scanned it for whatever commonality might bind those highlighted names together.

Ah. Resident Institution: Simon Fraser.

“She had *friends*,” Sengupta murmured, almost to herself. “I bet she got away from ’em.

“I bet they want her back.”

REALITY IS THAT WHICH, WHEN YOU STOP BELIEVING
IN IT, DOESN'T GO AWAY.

—PHILIP K. DICK

JIM MOORE WAS dancing.

There was no floor to speak of. No partner. Not even any witnesses until Daniel Brüks climbed into the Hub; the command deck was uncharacteristically quiet, no tapping toes or clicking tongues, none of the staccato curses that Sengupta barked out when some command or interface didn't see things her way. Moore was alone in the cluttered landscape, leaping from a stack of cargo cubes, rebounding off some haphazard plateau halfway down, hitting the deck for just a split second in a perfect barefoot crouch before bouncing back into the air: one arm tight across his chest, the other jabbing at some invisible partn—

Opponent, Brüks realized. Those open-handed strikes on empty air, that heel coming down with a *snap* against a passing bulkhead: those were combat moves. Whether he was

interacting with a virtual partner in ConSensus or merely faking it old school, Brüks had no idea.

The dancing warrior caught a loose strap of cargo webbing floating from the grille, swung legs overhead, and planted them against the bulkhead: hands pulling against strap in lieu of gravity, legs pushing back from the grille in opposition, a human tripod planted against the wall like a three-legged spider. Brüks could clearly see his face. Moore wasn't even breathing through the mouth.

"Nice moves," Brüks said.

Moore looked right past him and lifted his feet without a word, turning slowly around the strap like a windmill in a light breeze.

"Uh..."

"Shhh."

He jumped a little at the hand on his arm. "You don't want to wake him up," Lianna said softly.

"He's *asleep*?" Brüks looked back at the ceiling; Moore was spinning more quickly now, head out, legs spread in a V, the strap winding tighter between man and metal. In the next instant he was airborne again.

"Sure." Lianna's dreads bobbed gently in the wake of her nod. "What, you stay *awake* when you exercise? You don't find it, um, boring?"

He didn't know whether she was taking a shot at the thought of Dan Brüks coming equipped with some kind of sleepwalking option, or the equally ludicrous thought of Dan Brüks working out.

"Why do it at all? A dose of AMPK agonist and he's a hardbody even if he lies in bed snarling bonbons all day."

"Maybe he doesn't want to depend on augments that can be hacked. Maybe the endorphins give him happier dreams. Maybe old habits die hard."

Moore sailed over their heads, stabbing the air. Brüks ducked despite himself.

Lianna chuckled. "Don't worry about that. He can see us just fine." She caught herself: "Something in there can, anyway." A

kick and a glide took her to the port staircase. “Anyway, don’t waste your time with that loser—the moment he wakes up he’ll just dive back into his *Theseus* files.” She jerked her chin. “I’ve got some time to kill. Come play with me instead.”

“Play w—” But she’d already turned like a fish and darted down the spoke. He followed her back to the heavy quarters, to the Commons where Moore’s green bottle and his own abandoned gimp hood clung to the bulkhead between bands of minty astroturf.

“Play what?” he asked, catching up. “Tag?”

She grabbed his hood off the wall and tossed it to him, flumping into a convenient hammock in a single smooth motion. “Anything you want. Deity Smackdown. Body-swap boxing is kinda fun. Oh, and there’s a Kardashev sim I’m pretty good at, but I promise to go easy on you.”

He turned the Interloper Accessory over in his hands. The frontal superconductors stared up at him like a pair of startled eyes.

“You *do* remember that’s mainly a gaming hood, right?”

He shook his head. “I don’t game.”

Lianna eyed him as though he’d just claimed to be a hydrangea. “Why ever *not*?”

Of course he couldn’t tell her. “It’s not *real*.”

“It’s not supposed to be,” she explained, surprisingly patient. “That’s what makes them games.”

“Doesn’t *feel* real.”

“Yeah it does.”

“Not to me.”

“Yeah it does.”

“*Not to—*”

“Not to put too fine a point on it, Oldschool, but *Yes it does*.”

“Don’t lecture me about my own perceptions, Lee.”

“It’s the *same neurons*! The same signal running up the same wiring, and there’s *absolutely no way* your brain can tell the difference between an electron that came all the way from your retina and one that got injected midstream. Absolutely no way.”

“Doesn’t *feel* real,” he insisted. “Not to me. And I’m not

playing Porn Star Cat Wars with you.”

“Just *try*, man.”

“Play the AI. It’ll give you a better run for your money anyway.”

“It’s not the sa—”

“Hah!”

Lianna’s face fell. “*Fuck*. Skewered by my own position statement.”

“By a roach, no less. How’s it feel?”

“Like I just punched myself in the nose,” she admitted.

Neither spoke for a moment.

“Just once? For me?”

“*I don’t game.*”

“Okay, okay. No harm in asking.”

“Now you’ve asked.”

“Okay.” She swung back and forth in the hammock for a few seconds. (There was something a little off about that motion, a hinted half-spiral oscillation. Coriolis was a subtle trickster.)

“If it makes you feel any better,” she said after a while, “I kinda know what you mean.”

“About?”

“About things not seeming real. I actually feel that way all the time. Gaming’s the only time I *don’t* feel that way.”

“Huh,” Brüks grunted, a little surprised. “I wonder why.”

And after a moment’s thought: “Probably the company you keep.”

Someone had set up a second tent next to his, stuck it like an engorged white blood cell right at the base of the ladder. Brüks had to effect a half hop sideways off the second rung to avoid bumping it. Something rustled and muttered inside.

“Hello?”

Sengupta stuck her head out, stared at the deck. “Roach.”

Brüks coughed. “You know, that doesn’t actually sound as much like a compliment as you might think.”

She didn’t seem to hear him. “You should see this,” she said,

and withdrew.

And poked her head out again after a few seconds: “Well come *on*.”

He hunkered gingerly down into the tent. Sengupta crouched at its center. Patches of flickering intelligence swarmed across the fabric: columns of numbers; crude plastic-skinned portraits rendered by some computer sketch artist struggling with insufficient eye-witness data; rows of—home addresses, from the look of it.

“What’s this?”

“Nothing you care about.” Reflected lightning played across her face. “Just some fucker going to be eating his own guts when I get hold of him.” She waved one hand and the collage disappeared.

“You do realize they’ve got a whole hab set up as a dorm,” Brüks said.

“That’s too crowded nobody uses this one.”

“I use—” *Never mind*.

A roommate might not be so bad, he reflected. He’d have never sought one out—good parasites do not draw attention to themselves, no matter how lonely the lifestyle—but if things went south, maybe Valerie would eat Rakshi first. Buy him some time.

“Watch this best party trick *ever*.”

She threw a video feed onto the wall: rowdy voices, flashing lights, a maglev table wobbling at an insane angle thanks to the drunken asshole trying to dance on the damn thing. Campus bar. The student ambience would be a dead giveaway anywhere on the planet but Brüks was pretty sure it was somewhere in Europe. The subtiter was off but he caught snatches of German and Hungarian at least.

A couple of grad students had randomly arranged a dozen empty beer glasses on a table. A crowd of others cheered and chanted and pulled chairs away, clearing a surrounding space. Something was happening stage left, just out of camera range: an *antidisturbance*, a sudden contagious quelling of noise and commotion that drew eyes and spread around the circle in an

instant. The camera turned toward the eye in the storm. Brüks sucked in his breath.

Valerie again.

She stalked into the cleared floor space like a spring-loaded panther, unleashed, autonomous. She wore the cheap throwaway smart-paper weave ubiquitous to lab rats and convicts the world over; it seemed absurd against the jostling background of blazers and holograms and bioluminescent tattoos. Valerie didn't seem to notice her own violation of the dress code; didn't notice the way the front lines pushed back against the crowd as she passed, or the way the murmuring horde fell silent when she got too close. She had eyes only for the glasses on the table.

What kind of suicidal idiot would take a vampire to a *bar*? How zoned had these people been, to not be fleeing for the exits?

"Where did you *get*—"

"*Shut up and watch!*"

Valerie circled the table, once. She hesitated for a moment, her eyes unfocused, something that might almost have been a smile playing across her lips.

In the next instant, she sprang.

She came down on one bare foot, almost three meters from a standing start; snapped the other down with a *stomp*, spun and stamped again and jumped—arcing backward this time, over the table itself, flipping in midair and landing in a four-point crouch (*left foot right foot right knee left hand*) before hopping to the left (*stomp*), hand-springing forward to land chest-to-face with some semisober sessional who still had enough animal sense to turn greeny-white under a face loaded with retconned chloroplasts. Straight up now: a vertical one-meter leap with a one-legged landing; about-face (*stomp*), two diagonal steps toward the table (*stomp*). Both elbows, one knee crashing simultaneously against ancient floorboards that bounced her smoothly back into a standing position. *Finis*. After a moment, the camera, shaking despite the very best image-stabilization algorithms a student budget could buy, panned back to the

table.

The glasses were arranged in a perfectly straight, evenly spaced line.

“Hard to find this one someone snuck her out the back door you take a vampire out without authorization and your career is *over* so they really kept the evidence locked up I think it was an initiation or something...”

The view hovered over the tableau for a long, disbelieving moment. Swung back to the monster who had created it. Valerie stared straight through the camera and a thousand kilometers beyond, smiled that patented bone-chilling smile. She wasn’t even breathing hard.

Everyone else was, though. Reality was finally cutting through the drinks and the drugs and the sheer idiotic bravado of spoiled children raised on promises of immortality. They were in the presence of black magic. They were in the presence of something whose most trivial efforts turned the very laws of motion into feats of telekinesis. And one sodden instant behind all that awe and stunned disbelief, perhaps, the realization of just what all that vast intelligence, all those superconducting motor skills had evolved in the service of.

Hunting.

It didn’t matter what bedtime stories these privileged brats had been told. They were not immortal in such a presence. They were only breakfast. And it was obvious to Brüks—from the way they pulled back and muttered their excuses, the way they edged for doors while keeping their backs to walls, the way even those pretending to be *in charge* averted their eyes as they scuttled sidelong up to Valerie and told her in weak and shaking voices that it was time to come in now—that they finally knew it.

It was also obvious, in hindsight, that Brüks had been uncharitable to the baselines who’d stolen their rat from its cage for one wild night out. Whoever they were, they hadn’t been suicidal. They hadn’t been idiots. No matter what they might have told themselves before or after, no matter who remembered having the idea.

It hadn't really been their decision at all.

The gimp hood did amp his learning curve. Brüks had to admit that much.

Data once forced to time-share the cramped real estate between bands of astroturf stretched luxuriously around him along three axes and three hundred sixty degrees of infinite space. Options he would have had to make eye contact with on a smart-paint display leapt front and center the moment he so much as *thought* about them. Information that he'd normally have to read, and repeat, and review—it seemed to just stick in the brain with a glance and a swallow. He was used to cognitive enhancers, of course, but this had to be Bicameral tech; he couldn't imagine that even surgical augments would deliver a bigger boost.

Three trillion nodes and a ten-thousand-link search radius was a pretty impoverished echo of the actual Quinternet, but you could still dig for a thousand lifetimes and never reach its edge. Instant expertise in a million disciplines. Interactive novels you didn't even have to play, first-person eidetic memories that planted themselves directly into your head if you had the interface (Brüks didn't, but this came close), served up all the thrills and wonder and experience of *just having played* without even needing to set aside the time to inhabit the story in real time. Indelible footprints of all the things the Noosphere deemed worthy of remembrance.

Even after fourteen years, *Theseus* was all over it.

The shock, the disbelief in the wake of Firefall. Riots in every color of the rainbow: terrified hordes fleeing the coming apocalypse, not knowing which way to run; demonstrations against movers and shakers who'd always known more than they let on; looters with short attention spans, thinking only of all that swag left undefended while panicked populations hid under their beds or lashed back against uniforms whose guns and drones and area-denial weaponry were finally, after uncounted decades of casual and brutal unaccountability, just

not up to the challenge. Tens of thousands returning from Heaven, fearful of new threats from the real world. Millions more fleeing *into* it, for pretty much the same reason.

And then, *Theseus*: the Mother Of All Megaprojects. A mission, a metaphor, a symbol of a shattered world reunited against the common threat. The brave souls who manned her, that small select force standing for Humanity against the cosmos. Amanda Bates, champion of countless WestHem campaigns: her skills so broad, her talents so highly classified that no one had even heard of her before her ascension to the Dream Team. Lisa Takamatsu, Nobel laureate, linguist, and den mother to a half-dozen separate personalities living in her own head. Jukka Sarasti, the noble vampire, the lion who'd lain down with lambs and was ready to give his life on their behalf. Siri Keeton, synthesist, ambassador to ambassadors, bridge between—

Wait a second—Siri?

He'd heard that name before. He sifted through dusty old memories laid down before the upgrade. Bulletins and biography washed over them in the meantime: Siri Keeton, synthesist, top of a field consisting exclusively of people at the top of their field. Possessed by demons at the age of six, some convulsive virus straight out of the Middle Ages that lit up his brain with electrical storms. It would have killed him outright if radical surgery hadn't snatched him back from the brink, patched him up, left him scarred and scared and possessed of something altogether new: a fierce never-say-die dedication to beating the odds, the world, to beating his own mutinous brain into submission and *getting the job done*, all the way out to the very edge of the solar system and beyond.

(Siri's not exactly baseline himself, actually...)

Almost nothing about his home life. No home vids, no leaked grade-school psych work-ups. An only child, apparently. Mother not mentioned at all, father left unnamed, a shadowy background figure that refused to come into focus except for one passing reference in *TimeSpace*:

...owes his single-minded pursuit of personal goals as much to his childhood battle with epilepsy as to his upbringing as a soldier's son...

Brüks turned the words over in his head, searching for coincidence.

"Yah Colonel Carnage had to go out and get his baby almost killed don'tcha know. Before he was even born."

The low gravity was no friend; Brüks jumped so high he cracked his head on the ceiling.

"*Je-sus!*" He pulled back the hood. Sengupta appeared between the interface dissolving in his head and the backup resurrecting on the bulkhead behind her. *I have got to figure out the privacy settings on this thing*, Brüks told himself. Not that they'd keep her from looking over his shoulder if she really wanted to, he supposed.

"Where did *you* come from?"

"I've been here all along five minutes at least."

"Well say something next time. Announce yourself." He rubbed the sore spot on his head. "What are you doing here anyway?"

Sengupta smacked her lips and cast sidelong eyes at her tent. "Hunting a dead man."

I am the only meat sack on this whole damn ship who isn't some kind of predator. "Hunting what?" One of the zombies?

"Not *on board* I mean like you"—snapping her fingers at the ConSensus display—"hunting *him*."

Brüks looked back at the wall: a factoid collage, a palimpsest of puff pieces. It didn't come anywhere close to biography.

"Jim nearly got him killed?"

"Yah I said that." *Snap snap.*

"Says here he had some kind of viral epilepsy."

Sengupta snorted. "They had to cut out half his brain for *viral epilepsy* right. Like anyone on Carnage's salary has to settle for leeches and laudanum when his brat gets sick."

"So what was it, then?"

"Viral *something*," Sengupta crowed. "Viral *zombieism*."

Ventilator sounds filled the sudden silence.

“Bullshit,” Brüks said softly.

“Oh he didn’t do it *deliberately* the larva was just collateral. Some evildoer cooked up a basement bug but he got the fine-tuning wrong. Virus likes fetus brains way better than grown-up brains right? All that growth metabolism all that neural pruning everything moves faster so they give it to Mommy and she gives it to Daddy but it *really* takes off when it gets past that old-time placenta in the third tri. Goes through baby’s brain faster’n flesh-eating. Wake up next morning the little fucker’s already seizing in the womb and it’s lucky for them it’s their canary in the coal mine, they go down to Emerg and shoot up on antizombals, get cleaned out just in time. But too late for little Siri Keeton. He comes into the world and he’s already damaged goods and they deal with it best they can they try all the best drugs and all the best lattices but it’s downhill all the way and after a few years the seizures start up and that’s all they wrote on Siri Keeton’s left hemisphere right? Had to scrape it out like a rotten coconut.”

“*Jesus*,” Brüks whispered, and glanced around despite himself.

“Oh you don’t have to worry about *him* he’s way down deep in his precious *Theseus* signals.” An odd, single-shouldered shrug. “Anyway it all turned out okay though better’n before like I say. Storm troopers have really good medical plans. Replacement hemisphere’s a big improvement. Made him the man for the mission.”

“What a horrible thing to do to a kid.”

“If you can’t grow the code stay out of the incubator. Fuckers probably did it himself to God knows how many others, that’s what they *do*.”

Brüks had seen the footage, of course: civilian hordes reduced to walking brain stems by a few kilobytes of weaponized code drawn to the telltale biochemistry of conscious thought. It wasn’t the precise surgical excision of cognitive inefficiency, not the military’s reversible supersoldiers or Valerie’s programmed bodyguards. It was consciousness and intellect just

chewed away from cortex to hypothalamus, Humanity reduced to fight/flight/fuck. It was people turned back into reptiles.

It was also a hell of an effective strategy for anyone on a budget: cheap, contagious, terrifyingly effective. If you were caught in some panicking crowd you could never be sure whether the person pushing from behind was trying to rape you, or bash in your skull, or just get the fuck out of the zone. If you were *above* the crowd all your state-of-the-art telemetry would never tell the undead from the merely undone; not even Tran tech could pick out the fractional chill of a zombie brain inside its skull, not from a distance, not through a wall or a roof, not in the middle of a riot. All you could do was seal off the area and try to keep upwind until the flamethrowers showed up.

They had special squads for that in India, Brüks had heard. People with off switches in their heads, fighting fire with fire. They were really good at their jobs.

“Had it coming you ask me,” Sengupta hissed.

“Jesus, Rakshi.” Brüks shook his head. “What do you have *against* that guy?”

“Nothing I don’t have against any jackboot who fucks people over and then’s all *just following orders*.” She poked at some unseen irritant with the toe of her boot. “Look I know you two are dating or whatever okay? Fine with me tell him whatever you want just don’t be surprised when he fucks you over. He’ll feed you into the meat grinder the moment he thinks it serves his *greater good*. Feed himself in too for that matter. I swear sometimes I don’t know which is worse.”

Neither spoke for a few moments.

“Why are you telling me this?” Brüks asked at last.

“Why not?”

“You’re not afraid I’ll pass it on?”

Sengupta barked. “Like you *would*. Besides he can’t blame me if he stomps his muddy footprints all over the ’base for anyone to see. *You* coulda seen ’em even.”

Why do I put up with her? Brüks asked himself for the tenth time. And then, for the first: *Why does she put up with me?*

But he thought he knew that answer already. He'd suspected it at least since she'd moved in next door: Sengupta *liked* him, in a weird twisted way. Not sexually. Not as a colleague or a peer, not even as a friend. Sengupta liked Daniel Brüks because he was easy to impress. She didn't think of him as a person at all; she thought of him as a kind of pet.

Shitty social skills. Rakshi Sengupta was too contemptuous of etiquette to be bothered. But the fact that she didn't abide by social cues didn't mean she couldn't read them. She'd read *him* well enough, at least; there was no way he'd ever tell Jim Moore what Sengupta had learned about his son. Not Dan Brüks.

He was a *good* boy.

The next time he saw Lianna, he didn't.

He heard her voice—"Whoa, *watch that*"—just a second before the hab tilted crazily askew and pain shot up from—in from...

Actually, he didn't know *where* the pain was coming from. It just *hurt*.

"Holy Heyzeus, Dan, you didn't *see* that?" Lianna popped magically into existence beside the Commons coffee table as he blinked up from the deck.

The table, he realized. *I ran into the table...*

He shook his head to clear it. Lianna vanished again—

"Hey—"

—and reappeared.

Brüks hauled himself to his feet, pulled the gimp mask off his face as the pain settled in his left shin. "There's something wrong with this thing. It's screwing with my eyes."

She reached out and took it. "Looks okay. What were you doing?"

"Just trawling the cache. Thought I'd bookmarked an article but I can't find the damn thing."

"You encrypt the search?"

Brüks shook his head. Lianna far-focused into ConSensus.

“Szpindel et al? ‘Gamma-protocadherin and the role of the PCDH11Y ortholog’?”

“That’s the one.”

“It’s right here.” She frowned, handed back the gimp hood. “Try again.”

He pulled it back on over his head. Search results reappeared in the air before him, but Szpindel wasn’t among them. “Still nothing.”

“Hmm,” Lianna said, and vanished.

“Where are you? You just dis—”

She leaned back into view from nowhere in particular.

“—appeared.”

“There’s the problem,” she said, and peeled the gimp hood back off his scalp. “Induced hemineglect. Probably a bad superconductor.”

“Hemineglect?”

“See why you should get augged? You could just pull up a subtitle, know exactly what I’m talking about.”

“See why I don’t?” Brüks conjured up a definition out of smart paint. “Nobody has to cut my head open to replace a bad superconductor.”

Broken brains that split the body down the middle and threw half of it away: an inability to perceive anything to the left of the body’s midline, to even *conceive* of anything there. People who only combed their hair on the right side with their right hands, who only saw food on the right side of their plates. People who just *forgot* about half the universe.

“That is fucked,” Brüks said, quietly awed.

Lianna shrugged. “Like I said, a bad superconductor. We got spares, though; faster’n fabbing a replacement.”

He followed her through the ceiling. “So you never told me why you *were* so old school,” she said over her shoulder.

“Fear of vivisection. When superconductors go bad. We covered this.”

“The reason that stuff goes bad is because it’s crappy old tech. Internal augs are less failure-prone than your own brain.”

“So they’ll work flawlessly when some spambot hacks in and

leaves me with an irresistible urge to buy a year's supply of bubble bath for cats."

"Hey, at least the augs are firewalled. It's *way* easier to hack a raw brain, if that's what you're worried about.

"Then again," she added, "I don't think it is."

He sighed. "No. I guess it isn't."

"What, then?"

They emerged into the southern hemisphere. Their reflections, thin as eels, slid across the mirrorball as they passed.

"Know what a funnel-web spider is?" Brüks asked at last.

After the barest hesitation: "I do now." And a moment later, "Oh. The neurotoxins."

"Not just any neurotoxins. This one was special. Pharm refugee maybe, or just some open-source hobby that got loose. Might have even been beneficial under other circumstances, for all I know. The little fucker got away. But I felt a *nip*, right about here"—he spread the fingers of one hand, tapped the webbing between thumb and forefinger with the other—"and I was flat on my back ten seconds later." He snorted softly. "Taught me not to go sampling without gloves, anyway."

They crossed the equator, single file. No one in the northern hemisphere.

"Didn't kill you, though," Lianna observed shrewdly.

"Nah. Just induced the mother of all allergic responses to nanopore antiglials. Any kind of direct neural interface finishes what that little bugger started."

"They could fix that, you know." Lianna bounced off the deck and glided along the forward ladder, Brüks clambering in her wake.

"Sure they could. I could take some proprietary drug for the rest of my life and let FizerPharm squeeze my balls every time they change their terms and conditions. Or I could get my whole immune system ripped out and replaced. Or I can take a couple of pills every day."

The attic.

A warren of pipes and conduits, an engineering subbasement

at the top of the ship. Plumbing, docking hatches, great wraparound bands full of tools and spacesuits and EVA accessories. Stone Age control panels in the catastrophic event that anyone might need to take manual control. A stale breeze caressed Brüks's face from some overhead ventilator; he tasted oil and electricity. Up ahead the docking airlock bulged to starboard like a tinfoil hubcap three meters across; a smaller lock, merely man-size, played sidekick across the compartment. Spacesuits drifted in their alcoves like dormant silver larvae. Portals and panels crowded the spaces between struts and LOX tanks and CO₂ scrubbers: lockers, bus boards, a head gimbaled for variable gee.

Lianna cracked one of the lockers and began rummaging about inside.

Yet another ladder climbed farther forward, out of the attic and up along a spire of dimly lit scaffolding. Afferent sensor array up there, according to the map. Maneuvering thrusters. And the parasol: that great wide conic of programmable metamaterial the *Crown* would hide behind when the sun got too close. Photosynthetic, according to the specs. Brüks didn't know whether it would shuttle enough electrons to run whatever backup drive the Bicamerals were putting together, but at least hot showers were always an option.

"Got it." Lianna held up a greasy-looking gray washer, smiling.

For a moment. The look of triumph drained from her face while Brüks watched; the expression left behind was bloodless and terrified.

"Lee...?"

She sucked in breath, and didn't let it out. She stared past his right shoulder as if he were invisible.

He spun, expecting monsters. Nothing to see but the airlock. Nothing to hear but the clicks and sighs of the *Crown of Thorns*, talking to itself.

"Do you hear that?" she whispered. Her eyes moved in terrified little saccades. "That—*ticking*..."

He heard the sigh of recycled air breathed into cramped

spaces, the soft rustle of empty spacesuits stirring in the breeze. He heard faint muffled sounds of movement from below: a scrape, a hard brief footfall. Brüks looked around the compartment, swept his eyes past alcoves and airlocks—

Now he heard something: sharp, soft, arrhythmic. Not a ticking so much as a *clicking*, a sound like, like a clicking tongue, perhaps. A *hungry* sound, from overhead.

His stomach dropped away.

He didn't have to look. He didn't dare to. Somehow he could *feel* her up there in the rafters: a dark predatory shadow, watching from places where the light couldn't quite reach.

The sound of teeth tapping together.

"*Shit*," Lianna whispered.

She can't be up there, Brüks thought. He'd checked the board before leaving the Commons. He *always* checked. Valerie's icon had been down in her hab where it always was, a green dot among gray ones. She must have *really* moved.

Of course, they could do that.

Now those clicking teeth were so loud he didn't know how he could have missed them. There was no pattern to that sound, no regular predictable rhythm. The silences between clicks stretched forever, drove him insane with trivial suspense; or snapped unexpectedly closed after a split second.

"Let's—" Brüks swallowed, tried again. "Let's get..."

But Lianna was already headed aft.

The Hub was bright light and sterile reflections: the soft glow of the walls chased Brüks's fears back to the basement where they belonged. He looked at Lianna a bit sheepishly as they rounded the mirrorball.

Lianna did not look sheepish at all. If anything, she looked more worried than she had in the attic. "She must have hacked the sensors."

"What do you mean?"

She wiggled her fingers in midair; INTERCOM appeared on the bulkhead. Sengupta was astern near the Hold; Moore was back in the Dorm.

Valerie's icon glowed reassuring green, down in her own

private hab with the grays.

“Ship doesn’t know where she is anymore,” Lianna said. “She could be anywhere. Other side of any door you open.”

“Why would she do that?” Brüks glanced up at the hole in the ceiling as Lianna grabbed the ladder. “What was she even doing up there?”

“Did you see her?”

He shook his head. “Couldn’t look.”

“Me, neither.”

“So for all we know, she wasn’t even up there.”

She managed a nervous laugh. “You wanna go back and check?”

Here among the bright lights and the gleaming machinery, it was hard not to feel utterly ridiculous. Brüks shook his head. “Even if she *is* up there, so what? It’s not like she’s confined to quarters. It’s not like she did anything other than—grind her teeth.”

“She’s a predator,” Lianna pointed out.

“She’s a sadist. She’s been pushing my buttons since day one; I think she just gets off on it. Jim’s right: if she wanted to kill us we’d be dead already.”

“Maybe this is *how* she kills us,” Lianna said. “Maybe she *mambos*.”

“Mambos.”

“Voodoo *works*, Oldschool. Fear messes up your cardiac rhythms. Adrenaline kills heart cells. You can literally scare someone to death if you hack the sympathetic nervous system the right way.”

So voodoo’s real, Brüks mused.

Chalk one up for organized religion.

. . .

Moore was heading down when Brüks was heading out.

“Hey, Jim.”

“Daniel.”

It didn't happen often anymore. Whether at meals or after, during the *Crown's* bright blue day or the warmer shadows of its night cycle, the Colonel always seemed to be deep in ConSensus these days. He never talked about what he did there. Cramming for Icarus, of course. Reviewing the telemetry *Theseus* had sent before disappearing into the fog. But he kept those details to himself, even when he came out to breathe.

Brüks stopped at the foot of the Commons ladder. "Hey, you want to see a movie?"

"A what?"

"*The Silences of Pone*. Like a game you can only watch. Lee says it's one of—you know, back when they couldn't just induce desired states directly. They had to manipulate you into feeling things. With plot and characters and so on."

"Art," Moore said. "I remember."

"Pretty crude by current standards but apparently it won a whole bunch of awards for neuroinduction back in the day. Lee found it in the cache, set up a feed. Says it's worth watching."

"That woman is getting to you," the Colonel remarked.

"This whole fucking *voyage* is getting to me. You in?"

He shook his head. "Still reviewing the telemetry."

"You've been doing that for a week now. You hardly come up for air."

"There's a lot of telemetry."

"I thought they went in and went dark."

"They did."

"Almost immediately, you said."

"*Almost* is a relative term. *Theseus* had more eyes than a small corporation. Take a lifetime to sift through even a few minutes of that feed."

"For a baseline, maybe. Surely the Bicams have everything in hand."

Moore looked at him. "I thought you didn't approve of blind faith in higher powers."

"I don't approve of breaking your back pushing boulders uphill when you're eyeprinted for the heavy lifter across the street, either. You said it yourself. They're a hundred steps

ahead of us. We're just here to enjoy the ride."

"Not necessarily."

"How so?"

"We're here. They're stuck in decompression for the next six days."

"Right," Brüks remembered. "Field-tested."

"Why they brought us along."

Brüks grimaced. "They brought *me* along because I happened to stumble onto the highway and they didn't have the heart to see me turn into roadkill."

The Colonel shrugged. "Doesn't mean they can't make the most of an opportunity when it presents itself."

Brüks's fingertips tingled in remembrance. *Opportunities*, he realized with sudden dull surprise.

I'm missing one.

It was a window in the crudest possible sense: a solid pane of transparent alloy, set into the rear bulkhead. You couldn't zoom it or resize it or lay a tactical false-color overlay across its surface. You couldn't even turn it off, unless someone on the other side brought down the blast shield. It was a clear, impenetrable *hole* in the ship: a circular viewport into an alien terrarium where, out past the ghostly reflection of his own face, strange hyperbaric creatures built monstrous artifacts out of sand and coral. Their eyes twinkled like green stars in the gloom.

Six of the monks were resting, suspended in medical cocoons like dormant grubs waiting out the winter. The others moved purposeful as ants across a background of shadows and half-built machinery: a jumbled cityscape of tanks and stacked ceramic superconductors and segments of pipe big enough to walk through without ducking. Brüks was pretty sure that the patchwork sphere coming together near the center of the Hold was shaping up to be the fusion chamber.

Two of the Bicamerals huddled off to one side in some sort of wordless back-to-back communion. A glistening gelatinous orb

floated beside them. Someone else (Evans, that was it) seized a nearby hand tool and lobbed it to starboard. It spun lazily end over end until Chodorowska reached up and snatched it from the air, without ever taking her eyes off the component in her other hand.

She'd never even looked. Which was not to say she hadn't seen it coming.

But of course, there was no *her*. Not right now, anyway. There was no Evans or Ofoegbu, either.

There was only the hive.

How had Moore put it? *Cognitive subspecies*. But the Colonel didn't get it. Neither did Lianna; she'd shared her enthusiastic blindness with Brüks over breakfast that very morning, ticked off in hushed and reverent tones the snips and splices that had so *improved* her masters: *No TPN suppression, no Semmelweis reflex. They're immune to inattentional blindness and hyperbolic discounting, and, Oldschool, that synesthesia of theirs—they reset millions of years of sensory biases with that trick. Randomized all the errors, just like that. And it's not just the mundane sensory stuff, it's not just feeling color and tasting sounds. They can literally see time...*

As if those were good things.

In a way, of course, they were. All those gut feelings, right or wrong, that had kept the breed alive on the Pleistocene savanna—and they *were* wrong, so much of the time. False negatives, false positives, the moral algebra of fat men pushed in front of onrushing trolleys. The strident emotional belief that children made you happy, even when all the data pointed to misery. The high-amplitude fear of sharks and dark-skinned snipers who would never kill you; indifference to all the toxins and pesticides that could. The mind was so rotten with misrepresentation that in some cases it literally had to be *damaged* before it could make a truly rational decision—and should some brain-lesioned mother abandon her baby in a burning house in order to save two strangers from the same fire, the rest of the world would be more likely to call her a monster than laud the rationality of her lifeboat ethics. Hell,

rationality itself—the exalted Human ability to *reason*—hadn’t evolved in the pursuit of truth but simply to win arguments, to gain control: to bend others, by means logical or sophistic, to your will.

Truth had never been a priority. If believing a lie kept the genes proliferating, the system would believe that lie with all its heart.

Fossil feelings. Better off without them, once you’d outgrown the savanna and decided that Truth mattered after all. But Humanity wasn’t defined by arms and legs and upright posture. Humanity had evolved at the synapse as well as at the opposable thumb—and those misleading gut feelings were the very groundwork on which the whole damn clade had been built. Capuchins felt empathy. Chimps had an innate sense of fair play. You could look into the eyes of any cat or dog and see a connection there, a legacy of common subroutines and shared emotions.

The Bicamerals had cut away all that kinship in the name of something their stunted progenitors called *Truth*, and replaced it with—something else. They might look human. Their cellular metabolism might lie dead on the Kleiber curve. But to merely call them a *cognitive subspecies* was denial to the point of delusion. The wiring in those skulls wasn’t even mammalian anymore. A look into *those* sparkling eyes would show you nothing but—

“Hey.”

Lianna’s reflection bobbed upside down next to his in the window. He turned as she reached past and unhooked her pressure suit from its alcove. “Hey.”

His eyes wandered back to the window. The back-to-back Bicamerals had ended their joint trance; they turned, simultaneously plunged their hands into the wobbling sphere at their side (*Water*, Brüks realized: *it’s just a blob of water*), dried off on a towel leashed to the bulkhead.

“I didn’t know,” he said, too quietly. As if afraid they’d hear him through the bulkhead. “How they work. What they—are.”

“Really.” She checked her suit O₂. “I would’ve thought the

eyes'd be a giveaway."

"I just assumed that was for night vision. Hell, I know people who retro fluorescent proteins as a fashion statement."

"Yeah, *now*. Back in the day they were—"

"Diagnostic markers. I figured it out." After Moore had inspired him to go back and actually look at the thing that had left all those corpses twisted like so much driftwood in the Oregon desert. It still lingered in his own blood, after all—and it had been almost too easy, the way the lab had taken that chimera apart and spread-eagled every piece for his edification. Streptococcal subroutines lifted from necrotizing myelitis; viral encephalitides laterally promoted from their usual supporting role in limbic encephalitis; a polysaccharide in the cell wall with a special affinity for the nasal mucosa. A handful of synthetic subroutines, built entirely from scratch, to glue all those incompatible pieces together and keep them from fighting.

But it had been the heart of that piecemeal bug that had betrayed the hive to Brüks's investigations: a subroutine targeting a specific mutation of the p53 gene. He hadn't got any direct hits when he'd run a search on that mutation, but the nearest miss was close enough to spill the secret: a tumor antagonist patented almost thirty years before.

As if someone had weaponized an anticancer agent.

"Doesn't it bother you?" he wondered now.

The suit had swallowed her to the waist. "Why should it?"

"They're *tumors*, Lee. Literally. Thinking tumors."

"That's a pretty gross oversimplification."

"Maybe." He wasn't clear on the details. Hypomethylation, CpG islands, methylcytosine—black magic, all of it. The precise and deliberate rape of certain methylating groups to turn interneurons cancerous, just so: a synaptic superbloom that multiplied every circuit a thousandfold. It was no joyful baptism, as far as Brüks could tell. There'd be no ecstasy in that rebirth. It was a breakneck overgrowth of weedy electricity that nearly killed its initiates outright, pulled sixty-million-year-old circuits out by the roots.

Lianna was right: the path was subtle and complex beyond human imagining, controlled with molecular precision, tamed by whatever drugs and dark arts the Bicamerals used to keep all that overgrowth from running rampant. But when the rites and incantations had been spoken, when the deed had been done and the patient sewn up, it all came down to one thing:

They'd turned their brains into cancer.

"I was so worked up about Lockett." Brüks shook his head at his own stupidity. "We just left him back there to die, you know, we left all of them—but he would have died anyway, wouldn't he? As soon as he graduated. Every pathway that ever made him what he was, the cancer would eat it all and replace it with something..."

"Something better," Lianna said.

"That's a matter of opinion."

"You make it sound so horrible." Wrist seals. *Click click*. "But you know, you went through pretty much the same thing yourself and you don't seem any the worse for it."

He imagined coming apart. He imagined every thread of conscious experience fraying and dissolving and being eaten away. He imagined dying, while the body lived on.

"I don't think so," he said.

"Sure. When you were a baby." She laid a gloved hand on his shoulder. "We *all* start out with heads full of random mush; it's the neural pruning afterward that shapes who we are. It's like, like sculpture. You start with a block of granite, chip away the bits that don't belong, end up with a work of art. The Bicams just start over with a bigger block."

"But it's *not you*."

"Enough of it is." She plucked her helmet out of the air.

"Sure, the *memories* stick." Some elements were spared: in the thalamus and cerebellum, hippocampus and brain stem all left carefully unscathed by a holocaust with the most discriminating taste. "But something else is remembering them."

"Dan, you gotta let go of this whole *self* thing. Identity changes by the second, you turn into someone else every time a new thought rewires your brain. You're already a different

person than you were ten minutes ago.” She lowered the helmet over her head, yanked it counterclockwise until it clicked into place. His fish-eye reflection slid bulging across her faceplate as she turned.

“What about you, Lianna?” he asked softly.

“What *about* me?” Her voice muffled and breathy across the glass.

“You aspiring to the same fate?”

She eyed him sadly from the bowl of her helmet. “It’s not like you think. Really.” And passed on to some farther shore.

THE INTUITIVE MIND IS A SACRED GIFT AND THE RATIONAL MIND IS A FAITHFUL SERVANT. WE HAVE CREATED A SOCIETY THAT HONORS THE SERVANT AND HAS FORGOTTEN THE GIFT.

—ALBERT EINSTEIN (APOCRYPHAL)

LOOK, BRÜKS WANTED to say: fifty thousand years ago there were these three guys spread out across the plain, and they each heard something rustling in the grass. The first one thought it was a tiger, and he ran like hell, and it *was* a tiger but the guy got away. The second one thought the rustling was a tiger, and *he* ran like hell, but it was only the wind and his friends all laughed at him for being such a chickenshit. But the third guy, *he* thought it was only the wind, so he shrugged it off and a tiger had him for dinner. And the same thing happened a million times across ten thousand generations—and after a while everyone was seeing tigers in the grass even when there weren’t any tigers, because even chickenshits have more kids than corpses do. And from those humble beginnings we learned to see faces in the clouds and portents in the stars, to see agency in randomness, because natural selection favors the paranoid. Even here in the twenty-first century you can make

people more honest just by scribbling a pair of eyes on the wall with a Sharpie. Even now, we are wired to believe that unseen things are watching us.

And it came to pass that certain people figured out how to use that. They painted their faces or they wore funny hats, they shook their rattles and waved their crosses and they said, *Yes, there are tigers in the grass, there are faces in the sky, and they will be very angry if you do not obey their commandments. You must make offerings to appease them, you must bring grain and gold and altar boys for our delectation or they will strike you down and send you to the Awful Place.* And people believed them by the billions, because after all, they could see the invisible tigers.

And you're a smart kid, Lianna. You're a bright kid and I like you but someday you've got to grow up and realize that it's all a trick. It's all just eyes scribbled on the wall, to make you think there's something looking back.

That's what Brüks wanted to say. And Lianna would listen, and ponder this new information, and she would come to see the wisdom of his argument. She would change her mind.

The only problem with this scenario was that it rapidly became obvious that she already *knew* all that stuff, and believed in invisible tigers anyway. It drove him up the fucking wall.

"That's not *God*," she said one morning in the Commons, wide eyed with astonishment that he could have made such a stupid mistake. "That's just a bunch of ritualistic junk that got stuck onto God by people who wanted to hijack the agenda."

A derisive snort from over by the galley dispenser. "Between you two arguing about ghosts and Carnage stringing out on rotten bits"—Sengupta grabbed her breakfast and headed for the ladder—"I don't think I can handle five more minutes of this shit."

Brüks watched her go, turned his attention to a bulkhead window Lianna had opened into the Hold: shadows, machine parts, weightless bodies drawing dismembered components together into tangled floating jigsaws. Binary stars, sparkling in the gloom.

"If it's junk, why do they keep doing it?" He jerked his thumb at the display. "Why can't those guys go thirty minutes without doing that hand-washing thing of theirs?"

"Hand-washing reduces doubt and second-guessing in the wake of making a decision," Lianna told him. "Brains tend to take metaphors literally."

"Bullshit."

Her eyes defocused for an instant. "I've just sent you the citation. Of course, an actual tweak would be more efficient—I bet they do that, too, actually—but I think they like to remember where they came from. You'd be surprised how much folklore has survival value when you rip it up and look at the roots."

"I never said religious beliefs weren't *adaptive*. That doesn't make them true." Brüks spread his hands, palms up.

"What do you think *vision* is?" she asked him. "You don't see a fraction of the things that surround you, and at least half the things you *do* see are deceptive. Hell, *color* doesn't even exist outside your own head. Vision's just plain *wrong*; it only persists because it *works*. If you're going to dismiss the idea of God, you better stop believing your own eyes in the bargain."

"My eyes never told me to murder anyone who doesn't share my worldview."

"My *God* never told me to do that, either."

"Lots of people's Gods have."

"Riiight. And we're just gonna ignore everybody who quoted Darwin to justify turning people into slaves? Or wiping them out altogether?" He opened his mouth; she preempted him with a raised hand: "Let's just agree that neither side has a monopoly on assholes. The point is, once you recognize that *every* human model of reality is fundamentally unreal, then it all just comes down to which one works best. And science has had a damn good run, no question. But the sun is setting on the Age of Empiricism."

He snorted. "The Age of Empiricism is just getting started."

"Come on, Oldschool. We're long past the days when all you had to do was clock a falling apple or compare beak length in

finches. Science has been running into limits ever since it started trying to get Schrödinger's cat to play with balls of invisible string. Go down a few orders of mag and everything's untestable conjecture again. Math and philosophy. You know as well as I do that reality has a *substructure*. Science can't go there."

"Nothing can. Faith may *claim*—"

"Knot theory," Lianna said. "Invented it for the sheer beauty of the artifact. We didn't have particle accelerators back then; we had no evidence at all that it would turn out to describe subatomic physics a century or two down the road. Pre-Socratic Greeks intuited atomic theory in 200 BC Buddhists were saying centuries ago that we can't trust our senses, that sensation itself is an act of faith. Hinduism's predicated on the Self as illusion: no NMRs a thousand years ago, no voxel readers. No *evidence*. And damned if I can see the adaptive advantage of not believing in your own existence; but neurologically it happens to be true."

She beamed at him with the beatific glow of the true convert. "There's an *intuition*, Dan. It's capricious, it's unreliable, it's corruptible—but it's so *powerful* when it works, and it's no coincidence that it ties into the same parts of the brain that give you the rapture. The Bicommerals harnessed it. They amped the temporal and they rewired the parietals—"

"You mean ripped them out completely."

"—and they had to leave conventional language back in the dust, but they figured it out. Their *religion*, for want of a better word, goes places science can't. Science backs it up, as far as science can go; there's no reason to believe it doesn't keep right on working after it leaves science behind."

"You mean you have *faith* it keeps working," Brüks observed drily.

"Do you measure Earth's gravity every time you step outside? Do you reinvent quantum circuits from scratch whenever you boot up, just in case the other guys missed something?" She gave him a moment to answer. "Science *depends* on faith," she continued, when he didn't. "Faith that the rules haven't

changed, faith that the other guys got the measurements right. All science ever did was measure a teensy sliver of the universe and assume that everything else behaved the same way. But the whole exercise falls apart if the universe doesn't follow consistent laws. How do you test if that's true?"

"If two experiments yield different results—"

"Happens all the time, my friend. And when it does, every good scientist discounts those results because they *failed to replicate*. One of the experiments must have been flawed. Or they both were. Or there's some unknown variable that'll make everything balance out just as soon as we discover what it is. The idea that physics *itself* might be inconsistent? Even if you considered the possibility in your wildest dreams, how could you test for it when the scientific method only works in a consistent universe?"

He tried to think of an answer.

"We've always thought c and friends ruled supreme, right out to the quasars and beyond," Lianna mused. "What if they're just—you know, some kind of local ordinance? What if they're a *bug*? Anyway"—she fed her plate into the recycler—"I gotta go. We're test-firing the chamber today."

"Look, science—" He marshaled his thoughts, unwilling to let it go. "It's not just that it works. We know *how* it works. There's no secret to it. It makes *sense*."

She wasn't looking at him. Brüks followed her eyes to the bulkhead feed. They all seemed more or less mended by now—Chinedum, Amratu, a handful of other demigods who'd never be more than names and ciphers to him—although the pressure still kept them captive for the moment. Still insufficiently omnipotent to speed the physics of decompression. It was a small comfort.

"Those guys do *not* make sense," he continued. "They roll around on the floor and ululate and you write up the patent applications. We don't know how it works, we don't know if it's going to *keep* working, it could *stop* working at any moment. Science is more than magic and rituals—"

He stopped.

Ululations. Incantations. Hive harmonics.

Rituals.

These feeds have motion cap, he remembered.

Colonel Jim Moore crouched sideways against the Commons wall like a monstrous grasshopper: legs folded tight at the knees, spring-loaded and ready to pop; thorax folded over them like a protective carapace; one hand dancing with some unseen ConSensus interface while the other, wrapped around a convenient cargo strap, held body to bulkhead. His eyes jiggled and danced beneath closed lids: blind to this impoverished little shell of a world, immersed in some other denied Daniel Brüks.

The grasshopper opened its eyes: glazed at first, clearing by degrees.

“Daniel,” it said dully.

“You look awful.”

“I asked for an onboard cosmetics spa before we launched. They went for a lab instead.”

“When was the last time you ate?”

Moore frowned.

“That does it. I’m buying, you’re eating.” Brüks stepped over to the galley.

“But—”

“Unless you think that anorexia’s the best way to prep for an extended field op.”

Moore hesitated.

“Come on.” Brüks punched in an order for salmon steak (he was still tickled by the fabber’s proficiency with extinct meats). “Lianna’s back in the Hold, and Rakshi’s—being Rakshi. You want me eating with *Valerie*?”

“So this is a rescue mission.” Moore unfolded himself onto the deck, relenting at last.

“That’s the spirit. What do you want?”

“Just coffee.”

Brüks glared at him.

“Okay, fine. Anything.” The Colonel waved a hand in

surrender. “Kruggets. With tandoori sauce.”

Brüks winced and relayed the order, tossed a ‘bulb of coffee across the compartment (Coriolis turned it into a curveball but Moore caught it anyway with barely a glance), grabbed one for himself and twisted the heat tab en route. He set the wobbly warming sphere onto the table and wound his way back to collect their meals.

“Still going over the *Theseus* data?” He pushed Moore’s fluorescent krill across the table and sat down opposite.

“I thought the whole point of this was to get my mind *off* that.”

“The point was to get you off your damn hunger strike,” Brüks said. “And to get me something to talk to besides the walls.”

Moore chewed, swallowed. “Don’t say I didn’t warn you.”

“Warn me?”

“I distinctly remember raising the possibility—the likelihood, even—that you might be bored out of your skull.”

“Believe me, I’m not complaining.”

“Yes you are.”

“Maybe a little.” (Why did everything from the galley taste like *oil*?) “But it’s not so bad. I got ConSensus, I got Lee to try and deprogram. Weigh a little cabin fever against getting stashed with the luggage for the next six months—”

“Believe me.” Moore smiled faintly. “There are worse things than extended unconsciousness.”

“For example?”

Moore didn’t answer.

The *Crown* did, though. In an instant she turned half the bulkhead bloody with Intercom alarms.

SENGUPTA, they screamed.

Moore commed the Hub while Brüks was still peeling himself off the ceiling. “Rakshi. What—”

Her words cascaded back, high-pitched and panicky: “She’s coming oh shit she’s coming up she *knows*—”

A pit opened in Brüks's stomach.

"I'm onto her I think she knows of course she knows she's a fucking *vampire* she knows *everything*—"

"Rakshi, where—"

"Listen to me you stupid roach she kil—oh *fu*—"

The channel died before she could finish, but it didn't really matter. You could have heard the screaming halfway to Mars.

Moore was through the ceiling in an instant. Brüks followed in his wake, a jump up the ladder, a grab for a passing handhold, the endless loop of the conveyor pulling him smoothly along the weight-loss gradient from hab to Hub. Moore had no time for that shit; he shot up the ladder two rungs at a time, then three, then four. He ricocheted free-falling out the top of the spoke before the belt had drawn Brüks even halfway. That was okay. Maybe he'd have everything fixed by the time Brüks made it to the top, maybe Sengupta's screams of rage would end and calm soothing voices would murmur in their stead, intent on reconciliation...

Sengupta's screams ended.

He tried to ignore the other voices, the ones in his head saying *Go back, you idiot. Let Jim handle it, he's a soldier for chrissakes, what are you gonna do against a goddamn vampire? You're collateral. You're lunch.*

That's right, Backdoor. Just turn around and run away. Again.

The conveyor, insensitive, drew him forward into battle.

He emerged into the southern hemisphere, knees shaking. There were no calm voices. There were no voices at all.

There was no reconciliation.

The vampire clung one-handed to the grille. Her other hand held Sengupta by the throat, right at eye level, as if the pilot were a paper doll. Valerie looked impassively into her victim's eyes; Sengupta squirmed and choked and didn't look back.

The south pole was a bright gaping pit to stern. Its reflection smeared across the mirrorball like a round toothless mouth. An image flashed across Brüks's forebrain, courtesy of his hind: Valerie tossing Sengupta into that maw. The *Crown of Thorns* closing its mouth and *chewing*.

Moore edged along the Tropic of Capricorn, feet just above the deck, hands open at his sides.

“Okay, we can take it from here.”

Not Moore. Lianna’s voice, ringing calm and clear from the back of the *Crown*’s throat. A moment later she sailed forth from its maw, fearless, light as air, heading directly for Valerie & Victim.

What’s wrong with her? “Lianna, *don’t*—”

“S’okay.” She spared a glance. “I’ve got it under—”

And was cut down with the sudden crack of bones snapping under the impact of Valerie’s foot, an obscene and elegant en pointe fired like a piston into Lutterodt’s rib cage. She spun back toward the south pole, a rag doll with no fixed center of gravity; the *Crown* caught her spine in passing, bent it the wrong way, tossed her back down its throat from whence she’d come.

Fuck fuck fuck—

“Let her go,” Moore was saying, his eyes still on Sengupta, calm as death. As though Lianna Lutterodt had never even made an appearance, as though she hadn’t just been swatted like a mosquito. As though she couldn’t possibly be bleeding out against the bulkhead a hundred meters to stern.

I have to help her.

Valerie kept eyes on Sengupta, head cocked like a predatory bird sizing up something shiny. “She attacks *me*.” Her voice was distant, almost distracted: voicemail from a monster with other things on its mind.

Brüks crept forward, belly against bulkhead: a strut here, a cargo strap there, hand over hand toward the south pole.

“She’s no threat.” Moore was behind Valerie now, looking past her shoulder to her prey. The prey croaked softly. “There’s no reason to—”

“Thank you for your tactical advice.” A faint white smile ghosted across her lips.

Was that a faint moan sighing up through the *Crown*’s throat? Still conscious, then, maybe. Still hope.

“Trade,” Valerie said.

“Yes,” Moore replied, moving forward.

“Not you.”

Suddenly Brüks was off the deck and yanked into the air; suddenly Valerie’s hand was around his throat, gripping him just below the jaw with fingers cold and sinuous as tentacles while a distant irrelevant Rakshi Sengupta bounced off the southern hemisphere, hacking, doubled over.

And when Valerie looked at *him* with that bemused and distant stare, he looked back. He tried not to. Over the slow burning in his lungs, over the casual pain of a larynx compressed just this side of strangulation, he would have given anything to turn away. Somehow he didn’t have the will. He couldn’t even close his eyes against hers.

Her pupils were bright bloody pinpoints, red stars clenched tight against the light of day. Behind them, the bulkhead rolled past in lazy slow motion.

The Hub dwindled to the wrong end of a telescope. Sengupta was shouting somewhere, her voice raw and tinny and barely audible over the white noise of distant pounding surf: *She killed one of them she killed one of her zombies one of her people he’s not on the board I can’t find him anywhere—*

There was nothing in Valerie’s face but that spectral half smile, that look of dispassionate appraisal. She didn’t seem to notice Moore slipping up from behind, or Sengupta screaming headlong back into the fray with claws bared. She didn’t even seem to notice her own left hand flicking back of its own accord to casually slap the pilot into the soldier, all that momentum spun impossibly on the head of a pin and redirected a hundred eighty degrees. *Fucking monster fucking monster fucking monster*, Sengupta shouted from across an ocean and Brüks could only think: *Cats and dogs cats and dogs...*

But none of that mattered. All that mattered were he and Valerie, alone together: the way she let just enough air past her fingers to keep him awake, the way she reached out with her free hand and tapped that light arrhythmic tattoo across his temple; the things she whispered for his ears only, intimate secrets of such vital importance he forgot them even as she

breathed them out along his cheek.

Behind her, Jim Moore grabbed a cargo strap and braced his feet against the wall. Valerie didn't even bother to keep him in view.

"Is it true?" he asked quietly.

"Of course it's fucking true she's a *vampire* she'd kill *all* of—"

Moore, eyes locked on Valerie, raised a palm in Sengupta's direction. Sengupta shut up as if guillotined.

"You think this matters." There was distant amusement in Valerie's voice, as if she'd just seen a rabbit stand up on its hind legs and demand the right to vote.

"You think so, too," Moore began. "Or—"

"—you wouldn't have reacted," he and Valerie finished in sync.

He tried again: "Were they under formal con...", they chorused. He trailed off, an acknowledgment of futility. The vampire even matched his ellipsis without missing a beat.

Sengupta fumed silently across the compartment, too smart and too damn stupid to be scared. Brüks tried to swallow, gagged as his Adam's apple caught between the vice of Valerie's thumb and forefinger.

"Malawi," Valerie said quietly, and: "Not mission-critical."

Brüks swallowed again. *As if there's anyone on this goddamn ship who's less mission-critical than me.*

Maybe Moore was thinking it, too. Maybe he decided to act on behalf of Daniel Brüks, the Parasite That Walked Like a Man. Or maybe he just took advantage of his adversary's distraction, maybe it didn't have anything to do with Brüks at all. But something—changed subtly, in Moore's stance. His body seemed *looser*, somehow, more relaxed, incongruously taller at the same time.

Valerie was still eye to eye with Brüks, but it didn't matter. It was obvious from the way her smile widened and cracked, from the tiny *click* of teeth against teeth: she could see everything that mattered about Moore's face, reflected in his own.

She turned, almost lazily, tossed Brüks aside like a cigarette butt. Brüks flailed across the open spine; he barely missed a

figure blurring past in the opposite direction. A cargo cube caught him and slapped him back off the deck. He doubled over, coughing, while Moore and Valerie danced in fast-forward. The monster's arms moved as though spun by a centrifuge; her body rebounded off the deck and shot through empty space where Jim Moore had existed a split second before.

"Fhat thouding do're."

Not a shout. Not even an exclamation. It didn't *sound* like a command. But those sounds reached into the Hub from the south pole and seemed to physically slap Valerie off target, reach right into the monster's head and grab her by the motor nerves. She twisted in midair, landed like a jumping spider on the curve of the bulkhead and froze there: eyes bright as halogen, mouth full of gleaming little shark teeth.

"Juppyu imaké."

Moore rose from a defensive crouch, studied hands half-raised against blows that hadn't materialized. Brought them down again.

Chinedum Ofoegbu rose from the throat of the *Crown*.

You can't do that, Brüks thought, astonished. *You're stuck in the Hold for another three days.*

"Prothat blemsto bethe?" Ofoegbu's hands fluttered like a pianist's against an invisible keyboard. The light in his eyes slithered like the aurora borealis.

I don't care how smart you are. You're still made out of meat. You can't just step out of a decompression chamber.

The Bicameral's blood must be fizzing in its flesh. All those bubbles out on early parole, all those gases freed from the weight of too many atmospheres: all set loose to party it up in the joints and capillaries...

One's all it'll take, one tiny bubble in the brain. A pinpoint embolism in the right spot and you're dead, just like that.

"Your vampire—" Sengupta began, before Moore preempted her with: "We have some *mission-critical* issues to deal with..."

But there is no you anymore, is there? You're just a body part, just a node in a network. Expendable. When the hive cuts you loose,

will you get it all back? Will Chinedum Ofoegbu wake up in time to die a roach's death? Will he change his mind too late, will he have a chance to feel betrayed before he stops feeling anything at all?

Ofoegbu coughed a fine red mist into the room. Blood and stars bubbled in his eyes. He began to fold at the middle.

Lianna Lutterodt climbed up in his wake, bent in on herself, one arm clenched tight to her side. With the other she reached out, wincing; but her master was too far away. She pushed off the lip of the south pole, floated free, caught him. Every movement took a visible toll.

"If you people are through trying to kill each other"—she coughed, tried again—"maybe someone could help me get him back to the Hold before he fucking *dies*."

"Holy *shit*," Brüks said, dropping back into Commons. The node was back with its network. Lianna was meshed and casted and had retreated to her rack while her broken parts stitched themselves back together.

Moore had already cracked open the scotch. He held out a glass.

Brüks almost giggled. "Are you kidding? *Now?*"

The Colonel glanced at the other man's hands: they trembled. "Now."

Brüks took the tumbler, emptied it. Moore refilled it without asking.

"This can't go on," Brüks said.

"It won't. It didn't."

"So Chinedum stopped her. This time. And it just about killed him."

"Chinedum was only the interface, and she knows that. She would have gained nothing and risked everything by attacking him."

"What if she'd pulled that shit a few days ago? What if she pulls it again?" He shook his head. "Lee could have been *killed*. It was just dumb luck that—"

"We got off lightly," Moore reminded him. "Compared to

some.”

Brüks fell silent. *She killed one of her zombies.*

“Why did she do it?” he asked after a moment. “Food? Fun?”

“It’s a problem,” the Colonel admitted. “Of course it’s a problem.”

“Can’t we do anything?”

“Not at the moment.” He took a breath. “Technically, Sengupta *did* attack first.”

“Because Valerie *killed* someone!”

“We don’t know that. And even if she did, there are—jurisdictional issues. She may have been within her rights, legally. Anyway, it doesn’t matter.”

Brüks stared, speechless.

“We’re a hundred million clicks from the nearest legitimate authority,” Moore reminded him. “Any that might happen by wouldn’t look more kindly on us than on Valerie. Legalities are irrelevant out here; we just have to play the hand we’re dealt. Fortunately we’re not entirely on our own. The Bicamerals are at least as smart and capable as she is. Smarter.”

“I’m not worried about their *capabilities*. I don’t trust them.”

“Do you trust me?” Moore asked unexpectedly.

Brüks considered a moment. “Yes.”

The Colonel inclined his head. “Then trust them.”

“I trust your *intentions*,” Brüks amended softly.

“Ah. I see.”

“You’re too close to them, Jim.”

“No closer than you’ve been, lately.”

“They had their hooks into you *way* before I joined the party. You and Lianna, the way you just—*accept* everything...”

Moore said nothing.

Brüks tried again. “Look, don’t get me wrong. You went up against a vampire for us, and you could’ve been killed, and I know that. I’m grateful. But we got lucky, Jim: you’re usually wrapped up in that little ConSensus shell you’ve built for yourself, and if Valerie had chosen any other time to torque out —”

“I’m *wrapped up in that shell*,” Moore said levelly, “dealing

with a potential threat to the whole—”

“Uh-huh. And how many new insights have you gained, squeezing the same signals over and over again since we broke orbit?”

“I’m sorry if that leaves you feeling vulnerable. But your fears are unfounded. And in any case”—Moore swallowed his own dram—“planetary security has to take priority.”

“This isn’t about planetary security,” Brüks said.

“Of course it is.”

“Bullshit. It’s about your son.”

Moore blinked.

“Siri Keeton, synthesist on the *Theseus* mission,” Brüks continued, more gently. “It’s not as though the crew roster was any kind of secret.”

“So.” Moore’s voice was glassy and expressionless. “You’re not as completely self-absorbed as you appear.”

“I’ll take that as a compliment,” Brüks tried.

“Don’t. The presence of my son on that mission doesn’t change the facts on the ground. We’re dealing with agents of unknown origin and vastly superior technology. It is my *job*—”

“And you’re doing that job with a brain that still runs on love and kin selection and all those other Stone Age things we seem hell-bent on cutting out of the equation. That would be enough to tear anyone apart, but it’s even harder for you, isn’t it? Because one of those facts on the ground is that you’re the reason he was out there in the first place.”

“He’s out there because he’s the most qualified for the mission. Full stop. Anyone in my place would have made the same decision.”

“Sure. But we both know *why* he was the most qualified.”

Moore’s face turned to granite.

“He was most qualified,” Brüks continued, “because he got certain augments during childhood. And he got those augments because you chose a certain line of work with certain risks, and one day some asshole with a grudge and a splicer kit took a shot at you and hit him instead. You think it’s your fault that some Realist fuckwit missed the target. You blame yourself for

what happened to your son. It's what parents *do*."

"And you know all about being a parent."

"I know about being *Human*, Jim. I know what people tell themselves. You made Siri the man for the job before he was even born, and when the Fireflies dropped in you had to put him at the top of the list and ship him out and now all you've got is those goddamned signals, that's your last link, and I *understand*, man. It's natural, it's Human, it's, it's *inevitable* because you and I, we haven't gotten around to cutting those parts out of us yet. But just about everyone else around here has, and we can't afford to ignore that. We can't afford to be—distracted. Not here, not *now*."

He held out his glass, and felt a vague and distant kind of relief at how steady his hand was around the crystal. Colonel Jim Moore regarded it for a moment. Looked back at the half-empty bottle.

"Bar's closed," he said.

PREY

Of greater concern are the smaller networks pioneered by the so-called Bicameral Order, which—while having shown no interest in any sort of military or political activism—remain susceptible to weaponization. Although this faction shares tenuous historical kinship with the Dharmic religions behind the Moksha Mind, they do not appear to be pursuing that group’s explicit goal of self-annihilation; each Bicameral hive is small enough (hence, of sufficiently low latency) to sustain a coherent sense of conscious self-awareness. This would tend to restrict their combat effectiveness both in terms of response-latency and effective size. However, the organic nature of Bicameral MHIs leaves them less susceptible to the signal-jamming countermeasures that bedevil hard-tech networks. From the standpoint of brute military force, therefore, the Biculars probably represent the greatest weaponization potential amongst the world’s extant mind hives. This is especially troubling in light of the number of technological and scientific advances attributable to the Order in recent years, many of which have already proven destabilizing.

—J. Moore, “Hive Minds, Mind Hives, and
Biological Military Automata: The Role of
Collective Intelligence in Offline Combat,”
Journal of Military Technology 68 no. 14
(December 3, 2005)

A SUN GROWN huge. A shadow on its face. A fleck, then a freckle: a dot, a disk, a *hole*. Smaller than a sunspot—darker, more symmetrical—and then larger. It grew like a perfect tumor, a black planetary disk where no planet could be, swelling across the photosphere like a ravenous singularity. A sun that covered half the void: a void that covered half the sun. Some critical, razor-thin instant passed and foreground and background had switched places, the sun no longer a disk but a brilliant golden iris receding around a great dilating pupil. Now it was less than that, a fiery hoop around a perfect starless hole; now a circular thread, writhing, incandescent, impossibly fine.

Gone.

A million stars winked back into the firmament, cold dimensionless pinpricks strewn in bands and random handfuls across half the sky. But the other half remained without form and void—and now the tumor that had swallowed the sun was gnawing outward at the stars as well. Brüks looked away from that great maw and saw a black finger lancing through the starfield directly to port: a dark spire, five hundred kilometers long, buried deep in the shade. Brüks downshifted his personal spectrum a few angstroms and it glowed red as an ember, an infrared blackbody rising from the exact center of the disk ahead. Heat radiator. A hairbreadth from the center of the solar system, it never saw the sun.

He tugged nervously at the webbing holding him to the mirrorball. Sengupta was strapped into her usual couch on his left, Lianna to his right, Moore to hers. The old warrior had barely said a word to him since Brüks had broached the subject of his son. Some lines were invisible until crossed, apparently.

Or maybe they were perfectly visible, to anyone who wasn't an insensitive dolt. Empiricists always kept their minds open to alternative hypotheses.

He sought refuge in the view outside, dark to naked eyes but alive on tactical. Icons, momentum vectors, trajectories. A thin

hoop of pale emerald shrank across the forward view, drawing tight around the *Crown's* nose: the rim of her reflective parasol—erased from ConSensus in deference to an uninterrupted view—redundant now, spooling tight into stowage. The habs had already been folded back and tied down for docking. Beyond the overlays, the *Crown* fell silently past massive structures visible only in their absence: shadows against the sky, the starless silhouettes of gantries and droplet-conveyors, endless invisible antennae belied by the intermittent winking of pilot lights strung along their lengths.

The *Crown* bucked. Thrusters flared like the sparks of arc welders in the darkness ahead. *Down* returned, dead forward. Brüks fell gently from the couch into the elastic embrace of his harness, hung there while the *Crown's* incandescent brakes gave dim form to the face of a distant cliff: girders, the cold dead cones of dormant thrusters, great stratified slabs of polytungsten. Then the sparks died, and *down* with them. All that distant topography vanished again. The *Crown of Thorns* continued to fall, gently as thistledown.

“Looks normal so far,” Moore remarked to no one in particular.

“Wasn’t there supposed to be some kind of standing guard?” Brüks wondered. There’d been an announcement, anyway, in the weeks after Firefall. *While we have seen no evidence of ill will on the part of* blah blah blah *prudent to be cautious* yammer yammer *cannot afford to leave such a vital source of energy undefended in the current climate of uncertainty* yammer blah.

Moore said nothing. After a moment Lianna took up the slack: “The place is almost impossible to see in the glare unless you know where to look. And there’s nothing like a bunch of big obvious heatprints going back and forth for telling the other guys where to look.”

It was as much as she’d said—to Brüks, at least—since Valerie had flexed her claws in the Hub. He took it as a good sign.

More sparks, tweaking the night in split-second bursts. Wireframes crawled all over tactical now, highlighting

structures the naked eye could barely discern even as shadows. Constellations ignited on the cliff ahead, lights triggered by the presence of approaching mass, dim and elegant as the photophores of deep-sea fish. Candles in the window to guide travelers home. They rippled and flowed and converged on a monstrous gray lamprey uncoiling from the landscape beneath. Its great round mouth pulsed and puckered and closed off the port bow.

One final burst of counterthrust. The lamprey flinched, recoiled a meter or two, resumed its approach. The *Crown* was barely moving now. The lamprey closed on the port flank and attached itself to the docking hatch.

“We are down to fumes felching Bicams better know what they’re doing because even our *chemical* just ran dry,” Sengupta reported. “You want this ship to go anywhere now you gotta get out and push.”

“Not a problem,” Moore said. “We’re sitting on the biggest charger in the solar system.”

Lianna looked at Brüks and tried to smile.

“Welcome to Icarus.”

Of course, no one was going to fuck on a first date.

The sky in the Hub began to fill with handshakes and head shots: Icarus and the *Crown* introducing each other, coming to terms, agreeing that this little rendezvous was an intimate affair that really didn’t warrant the involvement of Earthbound engineers. Sengupta whispered sweet nothings to the station’s onboard, coaxed it into turning on the lights, booting up life-support, maybe sharing a few pages from its diary.

Naked bodies floated up from the lower hemisphere. Eulali and one of the other Bicamerals (*Haina*, Brüks thought), purged of hostile microbes and decompressed at last, slumming it with the baselines. Nobody seemed to think it worthy of comment.

“No one since the last on-site op check.” Sengupta jabbed one finger at a window full of alphanumeric gibberish. “Nobody came or went anytime in the last eighteen months. Boosters

fired a hundred ninety-two days ago to stabilize the orbit but nothing else.”

Sudden swift movement from the corners of both eyes: the undead in formation, shooting single-file through the hatch like raptors diving for a kill. They bounced off the sky, swung around the forward ladder, disappeared through the ceiling fast and fluid as barracuda.

So much for the pack, Brüks thought nervously. *What about the Alph*—and didn’t finish the question, because the flesh crawling up his backbone had just given him the answer.

She was right behind him. For all he knew, she always had been.

The Bicamerals didn’t seem to notice. They hadn’t taken their eyes off tactical since they’d arrived. Brüks swallowed and forced his gaze left. He forced himself to turn. He resisted the urge to lower his gaze as Valerie came into view, forced himself to look her right in the eyes. They shone back at him. He gritted his teeth and thought very hard about leucophores and thin-film optics and finally realized: *She’s not even looking at me.*

She wasn’t. Those bright monster eyes burned a path right past him to the dome behind, shifted and jiggled in microscopic increments to this datum or that image, jittered fast as the eyes of zombies and with twice the intensity. Brüks could almost see the brain sparking behind those lenses, the sheets of electricity soaking up information faster than fiber. It had all of them now, monks and monsters and minions alike, all of them finally brought together under a tiny metal sky crowded with the machinery of thought: boot sequences, diagnostics, the sprawling multidimensional vistas of a thousand mechanical senses. It threatened to overflow the hemisphere entirely, a ceaseless flickering infostorm that breached the equator and started spilling aft as Brüks watched.

Crude as papyrus, he realized. All these dimensions, squashed flat and pasted across physical space: it was a medium for cavemen and cockroaches, not these cognitive giants looming on all sides. Why were they even here? Why come together in the land of the blind when ConSensus went on forever, arrayed

endless intelligence throughout the infinite space within their own heads? Why settle for eyes of jelly when invisible signals could reach through bone and brain and doodle on the very synapses themselves—

Shit, he thought.

All that smart paint, so ubiquitous throughout the ship. He'd just assumed it was for ambient lighting, and a backup for backups should the implants fail in one of these overclocked brains. But now it seemed to be their preferred interface: crude, pointillist, *extrinsic*. Not completely unhackable, perhaps—but at least any intrusions would take place outside the head, would compromise the mech and not the meat. At least no alien, imagined or otherwise, would be rewriting the thoughts in the heads of the hive.

A few years to settle in, Moore had said. A few years for parties unknown to study new and unfamiliar technology, to infer the nature of the softer things behind it. Years to build whatever gears and interfaces an unlimited energy source could provide, and sit back, and wait for the owners to arrive. All that time for anything *in there* to figure out how to get *in here*.

They're afraid, Brüks realized, and then:

Shit, they're *afraid*?

Sengupta threw a row of camera feeds across the dome. Holds and service crawlways, mainly: tanks for the storage of programmable matter, warrens of tunnels where robots on rails slid along on endless missions of repair and resupply. Habs embedded here and there like lymph nodes, vacuoles to be grudgingly pumped full of warmth and atmosphere on those rare occasions when visitors came calling—but barren, uninviting, barely big enough to stand erect even if gravity had been an option. Icarus was an ungracious host, resentful of any parasites that sought to take up residence in her gut.

Something had done that anyway.

Sengupta grabbed that window and stretched it across a fifth of the dome: AUX/RECOMP according to the feed, a cylindrical compartment with another cylinder—segmented, ribbed, studded with conduits and access panels and eruptions of high-

voltage cabling—running through its center like a metal trachea. The view brightened as they watched. Fitful sparks ignited along the walls, caught steady, dimmed to a soft lemon glow that spread across painted strips of bulkhead. Wisps of frozen vapor swirled in weightless arabesques before some reawakened ventilator sucked them away.

Brüks had educated himself on the way down. He knew what he'd find if he were to cut that massive windpipe down the middle. At one end a great black compound eye, a honeycomb cluster of gamma-ray lasers aimed along the lumen of the tube. Pumps and field coils encircled that space at regular intervals: superconductors, ultrarefrigeration pipes to bring some hypothetical vacuum down to a hairbreadth of absolute zero. Matter took on strange forms inside that chamber. Atoms would lie down, forget about Brown and entropy, take a message from the second law of thermodynamics and promise to get back to it later. They would line up head to toe and lock into place as a single uniform substrate. A trillion atoms would condense into one vast entity: a blank slate, waiting for energy and information to turn it into something new.

Theseus had fed from something a lot like this, part of the same circuit in fact. Maybe it was feeding still. And down at the far end of AUX/RECOMP, past the lasers and the magnets and the microchannel plate traps, Brüks could see something else, something—

Wrong.

That was all he could tell, at first: something just a little bit *off* about the far end of the compiler. It took a few moments to notice the service port just slightly ajar, the stain leaking from its edges. His brain shuffled through a thousand cue cards and tried *spilled paint* on for size, but that didn't really fit. It looked too thick, too blobby for the smart stuff; and he'd seen no other surface painted that oily shade of gray on any of the other feeds.

Then someone zoomed the view and a whole new set of cues clicked into place.

Those branching, filigreed edges: like rootlets, like dendrites

growing along the machinery.

“Is it still coming through?” Lianna’s voice, a little dazed.

“Don’t be stupid you don’t think I’d *mention* it if it was? Wouldn’t work anyway some idiot left the port open.”

But life support had been shut down until the *Crown* had docked, Brüks remembered. Vacuum throughout. “Maybe it was running until you pressurized the habs. Maybe we—interrupted it.”

Those little pimply lumps, like—like some kind of early-stage fruiting bodies...

“I *told* you I’d mention it Jesus the logs say no juice for weeks.”

“Assuming we can trust the logs,” Moore said softly.

“It looks almost like dumb paint of some kind,” Lianna remarked.

Brüks shook his head. “Looks like a slime mold.”

“Whatever it is,” Moore said, “it’s not something any of our people would have sent down. Which raises an obvious question.”

It did. But nobody asked it.

Of course, no slime mold could survive in hard vacuum at absolute zero.

“Name one thing that can,” Moore said.

“*Deinococcus* comes close. Some of the synthetics come closer.”

“But *active*?”

“No,” Brüks admitted. “They pretty much shut down until conditions improve.”

“So whatever that is”—Moore gestured at the image—“you’re saying it’s dormant.”

Stranger even than the thing in the window: the experience of being asked for an opinion by anyone on the *Crown of Thorns*. The mystery lasted long enough for Brüks to glance sideways and see monks and vampire clustered in a multimodal dialogue of clicks and phonemes and dancing fingers. The

Bicamerals faced away from each other; they hovered in an impromptu knot, each set of eyes aimed out along a different bearing.

Jim may be Colonel Supersoldier to me, Brüks realized, *but we're all just capuchins next to those things...*

"I said—"

"Sorry." Brüks shook his head. "No, I'm not saying that. I mean, *look* at it: it's outside the chamber, part of it, anyway. You tell me if there's some way for that machine to assemble matter *off* the condenser plate."

"So it must have—grown."

"That's the logical conclusion."

"In hard vacuum, near absolute zero."

"Maybe not so logical. I don't have another answer." Brüks jerked his chin toward the giants. "Maybe they do."

"It *escaped*."

"If that's what you want to call it. Not that it got very far." The stain—or slime mold, or whatever it was—spread less than two meters from the open port before petering out in a bifurcation of rootlets. Of course, it shouldn't have even been able to do that much.

The damn thing looked *alive*. As much as Brüks kept telling himself not to jump to conclusions, not to judge alien apparitions by earthly appearance, the biologist was too deeply rooted in him. He looked at that grainy overblown image and he didn't see any random collection of molecules, didn't even see an exotic crystal growing along some predestined lattice of alignment. He saw something organic—something that couldn't have just *coalesced* from a diffuse cloud of atoms.

He turned to Moore. "You're sure Icarus's telematter technology isn't just a wee bit more advanced than you let on? Maybe closer to actual fabbing? Because that looks a lot like complex macrostructure to me."

Moore turned away and fixed Sengupta with a stare: "Did it—break out? Force open the port?"

She shook her head and kept her eyes on the ceiling. "No signs of stress or metal fatigue nothing popped nothing broken

no bits floating around. Just looks like someone ran a standard diagnostic took out the sample forgot to close the door.”

“Pretty dumb mistake,” Brüks remarked.

“Cockroaches make dumb mistakes all the time.”

And one of the biggest, Brüks did not say, was building you lot.

“ ‘Course there’s only so much you can see with a camera you gotta go in there and check to be sure.”

Up on the sky, the slime mold beckoned with a million filigreed fingers.

“So that’s the next step, right?” Brüks guessed. “We board?”

A grunted staccato from Eulali, with fingertip accompaniment. From any other primate it might have sounded like a laugh. The node spared him a look and returned her attention to the dome.

It wasn’t English. Brüks supposed it wasn’t even language, not the way he’d define it at least. But somehow he knew exactly what Eulali had meant.

You first.

Two hours later four of the Bicamerals and a couple of Valerie’s zombies were on the hull crawling forward along the *Crown*’s spine with a retinue of maintenance spiders, hauling torches and lasers and wrenches behind them. Two hours to start making half a ship whole again.

Three days to screw up the courage to go anywhere else.

Oh, they laid the groundwork. Sengupta did cam-by-cams of the whole frozen array, hijacked a couple of maintenance bots and sent them through every accessible corner and cranny. Brüks couldn’t make out any angels on the feeds. No asteroids, either, for that matter. He was starting to wonder if that code-name hadn’t been a red herring—a phrase set loose across the ether so pursuers wouldn’t think twice when the *Crown* relit her engines halfway through the innersys and accelerated away to some farther destination.

Squinting as hard as she could, all Sengupta could see was a small dark suspicion that disappeared when you laid an error

bar across it: "Station allometry's off by a few millimeters but it'd be weirder if you *didn't* get shrinkage and expansion with all the heat flux." The hive huddled together and passed occasional instructions through Lianna: *Bring the condenser up to twenty atmospheres. Freeze the chamber. Heat the chamber. Turn out the lights. Turn them on again. Vent the condenser back to vacuum. Here, fab this SEM and bot it over.*

The elephant in the room refused to rise to any flavor of bait. After three days, Brüks was itching for action.

"They want you to stay here," Lianna said apologetically. "For your own safety."

They floated in the attic, the *Crown's* viscera hissing and gurgling about them as a procession of Bicamerals climbed into spacesuits at the main airlock. A globe of water, held together by surface tension, wobbled in midair just off the beaten path. The soft light spilling from the lamprey's mouth washed everything in robin's egg.

"Now they're interested in my safety."

She sighed. "We've been over this, Dan."

Valerie emerged from the Hub and bared her teeth as she sailed past. Her fingers trailed along a bundle of coolant pipes, lightly tapping an arrhythmic tattoo. Brüks glanced at Lianna; Lianna glanced away. Up the attic, Ofoegbu plunged his hands into the water; pulled them out; rubbed them together before donning his gauntlets.

"You're going, though," Brüks observed. To work side by side with the creature who had nearly killed her without so much as a glance in her direction. He'd edged around the subject in casual conversation, what little of that there'd been lately. She hadn't seemed to want to talk about it.

"It's my job," she said now. "But you know, we're even keeping Jim pretty much in the background."

That surprised him. "Really?"

"We might bring him over once we're a little more sure of our footing—he was ground control for the *Theseus* mission, after all—but even then he'll mostly be remoting in from the *Crown*. The Bicams don't want to expose anyone to unnecessary

risk. Besides”—she shrugged—“what would you do over there anyway?”

Brüks shrugged. “Watch. Explore.” Farther up the hall, the blob shuddered afresh as the node called Jaingchu washed away her sins. *Why do all the bodies do that*, he wondered, *if there’s only one mind behind them all?*

“You’ll get better real-time intel back here.”

“I guess.” He shook his head. “You’re right, of course. They’re right. I’m just—going a bit stir-crazy in here.”

“I’d have thought you’d want *less* excitement in your life. The way things have been going lately, boredom’s something we should be *aspiring* to.” She managed a smile, laid a hand on his arm. “You’ll be as good as there. Looking right over my shoulder.”

Sengupta grunted from her couch as Brüks drifted back into the Hub. “So they won’t let you out to play.”

“They will not,” he admitted, and settled in beside her.

“Better view from here.” One foot tapped absently against the deck. “Wouldn’t wanna be over there anyway, not with that lot can’t even talk to them they got *shitty* manners in case you hadn’t noticed. Wouldn’t go over there if you paid me.”

“Thanks,” Brüks said.

“For what?”

For trying. For the comforting scritch between the ears.

Sengupta waved her hand as if spreading a deck of cards: a row of camera windows bloomed left to right across the dome. Gloved hands, visors, the backs of helmets; tactical overlays describing insides and outsides in luminous time-series.

The lamprey opened its mouth. The Bicameral entourage swam innocently down its throat.

Brüks pulled on his hood and booted up the motion sensors.

He wasn’t entirely useless. They set him to work reseeding the astroturf panels; scraping away the dead brittle stuff that had been sacrificed to cold and vacuum on the way down; spraying fresh nutrigel into the bulkhead planters; spraying, in turn, a

mist of microscopic seeds into the gel. The treated surfaces began to green up within the hour, but rather than watch the grass grow he looked on from a distance while Bicams and zombies swarmed across Icarus like army ants, carving great cookie-cutter chunks of polytungsten from its flanks and hauling them back to that jagged gaping stump where the *Crown* had been torn in two. Eventually they let him outside; the array itself was still off-limits but they let him help out closer to home, tutored him in the use of heavy machinery and set him loose on the *Crown's* hull. He torched pins and struts on command, helped shear the parasol free from its mooring at the bow and haul it aft; helped cut precise holes in its center for improvised thrusters that could stare down the heat of ten suns.

Other times he sat restlessly in the Hub while Sengupta ran numbers across the wall, this many tonnes and that many kilonewtons and so much Isp thrust. He'd tap into AUX/RECOMP and watch Valerie and Ofoegbu and Amina at work, scientific and religious paraphernalia floating about their heads as they attempted communion with an impossible slime mold from the stars. He'd capture their movements and their incantations, feed them to a private database he'd been building since before the *Crown* had docked. Sometimes Jim Moore would be there; other times Brüks would catch him sequestered in some far-off corner of the *Crown*, adrift on a sea of old telemetry that had nothing to do with his son, nothing at all, just facts on the ground.

The Colonel was always civil, these days. Never more.

When the sight of people in more productive roles failed to satisfy, Brüks abandoned Icarus's bustling tourist district and went off by himself, cam by cam: stepped through views of empty crawlspaces and frozen habs, an endless dark maze of tunnels connecting the uninhabited and the unexplored. Sometimes there was atmosphere, and frost sparkling on bulkheads. Sometimes there was only vacuum and girders and rails along which prehensile machinery scuttled like platelets in a mechanical bloodstream.

Once there were stars where no stars should have been: a great hole bitten out of Icarus's carapace where it would do the

least damage. Brüks could see incendiary Bicameral teeth through the gap, brilliant blue pinpoints taking another bite farther down the hull. Even filtered by the camera, they made him squint.

Next stop.

Ah. AUX/RECOMP again, more crowded than before: Moore had joined Valerie and the Bicamerals at play.

Just another roach, Brüks thought. *Just like me.*

But you get a seat at the table just the same.

He watched in silence for a few moments.

Fuck this.

Pale blue light spilled into the attic from the open airlock, limned the edges of pipes and lockers and empty alcoves. Brüks sailed through the hatch, grabbed a strut in passing, swung to port and into the glowing mouth of the lamprey itself.

Eyes hypersaccading in an ebony face, snapping instantly into focus. A body rooted to the airlock wall by one arm, fingers clenched around a convenient handhold. Spring-loaded prosthetics below the knees; they extended absurdly and braced against a bulkhead, blocking Brüks's way.

He braked just in time.

"Restricted access, sir," the zombie said, eyes dancing once more.

"Holy shit. You talk."

The zombie said nothing.

"I didn't think there'd be—anyone in there," Brüks tried. Nothing. "Are you awake?"

"No, sir."

"So you're talking in your sleep."

Silence. Eyes, jiggling in their sockets.

I wonder if it knows what happened to the other one. I wonder if it was there...

"I want to—"

"You can't, sir."

"Will you—"

“Yes, sir.”

—*stop me?*

“Yes but it won’t be necessary,” the zombie added.

Brüks had been wondering about lethal force. Maybe best not to push that angle.

On the other hand, the thing didn’t seem to mind answering questions...

“Why do your ey—”

“To maximize acquisition of high-res input across the visual field, sir.”

“Huh.” Not a trick the conscious mind could use, with its limited bandwidth. A good chunk of so-called vision actually consisted of preconscious filters deciding what *not* to see, to spare the homunculus upstream from information overload.

“You’re black,” Brüks observed. “Most of you zombies are black.”

No response.

“Does Valerie have a melanin feti—”

“I’ve got this,” Moore said, rising into view through the docking tube. The zombie moved smoothly aside to let him pass.

“They talk,” Brüks said. “I didn’t—”

Moore spared a glance at Brüks’s face as he moved past. Then he was back on board, and heading aft. “Come with me, please.”

“Uh, where?”

“M&R. Freckle on your face I don’t like the look of.” Moore disappeared into the Hub.

Brüks looked back at the airlock. Valerie’s sentry had moved back into place, blocking the way to more exotic locales.

“Thanks for the chat,” Brüks said. “We’ll have to do it again sometime.”

“Close your eyes.”

Brüks obeyed; the insides of his lids glowed brief bloody red as Moore’s diagnostic laser scanned down his face.

“Word of advice,” the Colonel said from the other side. “Don’t tease the zombies.”

“I wasn’t teasing him, I was just chat—”

“Don’t chat with them, either.”

Brüks opened his eyes. Moore was running his eyes down some invisible midair diagnostic. “Remember who they answer to,” he added.

“I can’t imagine that Valerie forgot to swear her minions to secrecy.”

“And I can’t imagine her minions will forget to tell her any secrets you might have asked about. Whether they answered or not.”

Brüks considered that. “You think she might take offense at the melanin-fetish remark?”

“I have no idea,” Moore said quietly. “I sure as hell did.”

Brüks blinked. “I—”

“You look at them.” There was liquid nitrogen in the man’s voice. “You see—zombies. Fast on the draw, good in the field, less than human. Less than animals, maybe; not even conscious. Maybe you don’t even think it’s *possible* to disrespect something like that. Like disrespecting a lawn mower, right?”

“No, I—”

“Let me tell you what I see. The man you were *chatting* with was called Azagba. Aza to his buddies. But he gave that up—either for something he believed in, or because it was the best of a bad lot of options, or because it was the only option he had. You look at Valerie’s entourage and you see a cheap joke. I see the seventy-odd percent of military bioauts recruited from places where armed violence runs so rampant that nonexistence as a conscious being is actually something you *aspire* to. I see people who got mowed down on the battlefield and then rebooted, just long enough to make a choice between going back to the grave or paying off the jump-start with a decade of blackouts and indentured servitude. And that’s pretty close to the *best-case* scenario.”

“What would be worst-case?”

“Some jurisdictions still hold that life ends at death,” Moore

told him. "Anything else is an animated corpse. In which case Azagba has exactly as many rights as a cadaver in an anatomy class." He stabbed the air and nodded: "I was right: it's precancerous."

Malawi, Brüks remembered.

"That's why you took her on," he realized. "Not for me, not for Sengupta. Not even for the mission. Because she killed one of your own."

Moore looked right through him. "I would have thought that by now you'd have learned to keep your attempts at psychoanalysis to yourself." He extracted a tumor pencil from the first-aid kit. "Any nausea? Headaches, dizziness? Loose stools?"

Brüks brought his hand to his face. "Not yet."

"Probably nothing to worry about, but we'll run a complete body scan just to be safe. Could be internal lesions as well." He leaned in, pressed the pencil against Brüks's face. Something electrical snapped in Brüks's ear; a sudden tingling warmth spread out across his cheek.

"I'd recommend daily scans from here on in," Moore said. "Our shielding on approach wasn't all it could have been." He gestured for Brüks to move to the right, unfolded the medbed from the wall. "I have to admit I'm a bit surprised this started so soon, though. Maybe you had a preexisting condition." He stood aside. "Lie back."

Brüks maneuvered himself over the pallet; Moore strapped him into place against the free fall. A biomedical collage bloomed across the bulkhead.

"Uh, Jim..."

The soldier kept his eyes on the scan.

"Sorry."

Moore grunted. "Perhaps I shouldn't have expected you to be so fast on the uptake." He paused. "It's not as though you're some kind of zombie."

"Roaches, you know—we fuck up," Brüks admitted.

"Yes. I forget that sometimes." The Colonel took a breath, let it out softly through clenched teeth. "Before you showed up, I—

well...”

Brüks waited in silence, fearful of tipping some scale.

“It’s been a while,” Moore said, “since I’ve had much call to deal with my own kind.”

GOD CREATED THE NATURAL NUMBERS. ALL ELSE IS
THE WORK OF MAN.

—LEOPOLD KRONECKER

“GOT SOMETHING FOR you.”

It was a white plastic clamshell, about the size and shape to hold a set of antique eyeglasses. Lianna had fabbed a bright green bow and stuck it to the top.

Brüks eyed it suspiciously. “What is it?”

“The Face of God,” she declared, and then—deflated by the look he shot at her, “That’s kind of what the hive’s calling it, anyway. Piece of your slime mold.” She held it out with a flourish. “If Muhammad can’t come to the sample...”

“Thanks.” He took the offering (try as he might, he couldn’t keep from smiling), and set it on the table next to dessert.

“They thought you’d like to take a shot at, you know. Seeing what makes it tick.”

Brüks glanced at a bulkhead window where three Bicamerals floated at the compiler, their gazes divergent as was their wont. (Not any Senguptoid aversion to eye contact, he’d come to realize; just the default preference for a 360-degree visual field, adopted by a collective with eyes to share.) “Are they throwing me a bone, or do they just want someone expendable doing the dissections?”

“A bone, maybe. But you know, this thing does have certain biological properties. And you are the only biologist on board.”

“Roach biologist. And that slime mold’s got to be *postbiological* if it’s anything at all. And you know as well as I

do that I've got better odds of getting a blow job from Valerie than—"

He caught himself, too late. *Idiot. Stupid, insensitive—*

"Maybe not," Lianna said after a pause so brief it might have been imaginary. "But you're the only one in the neighborhood with a biologist's perspective."

"You—you think that makes a difference?"

"Sure. More to the point, I think they do, too."

Brüks thought about that. "I'll try not to let them down, then." And then: "Lee—"

"So what you doing here, anyway?" She leaned in for a closer look at his display. "You're running mo-cap."

He nodded, wary of speech.

"What for? Slimey hasn't moved since we got here."

"I'm, uh..." He shrugged and confessed. "I'm watching the Bicams."

She raised an eyebrow.

"I've been trying to figure out their methodology," he confessed. "Everyone's got to have one, right? Scientific or superstitious or just some weird gut instinct, there's at least got to be some kind of *pattern*..."

"You're not finding one?"

"Sure I am. They're *rituals*. Eulali and Ofoegbu raise their hands just so, Chodorowska howls at the moon for precisely three-point-five seconds, the whole lot of them throw their heads back and *gargle*, for fucksake. The behaviors are so stereotyped you'd call them neurotic if you saw them in one of those old labs with the real animals in cages. But I can't correlate them to anything *else* that happens. You'd think there'd be some kind of sequence, right? Try something, if that doesn't work try something else. Or just follow some prescribed set of steps to chase away the evil spirits."

Lianna nodded and said nothing.

"I don't even know why they bother to *make* sounds," he grumbled. "That quantum callosus or whatever they have has got to be faster than any kind of acoustic—"

"Don't spend too much effort on that," Lianna told him. "Half

those phonemes are just a side effect of booting up the hyperparietals.”

Brüks nodded. “Plus I think the hive—fragments sometimes, you know? Sometimes I think I’m looking at one network, sometimes two or three. They drop in and out of sync all the time. I’m correcting for that—trying to, anyway—but I still can’t get any correlations that make sense.” He sighed. “At least with the Catholics, you know that when someone hands you a cracker there’s gonna be wine in the mix at some point.”

Lianna shrugged, unconcerned. “You gotta have faith. You’ll figure it out, if it’s God’s will.”

He couldn’t help himself. “Jesus *Christ*, Lee, how can you keep *saying* that? You know there’s not the slightest shred of evidence—”

“*Really*.” In an instant her body language had changed; suddenly there was fire in her eyes. “And what kind of *evidence* would be good enough for you, Dan?”

“I—”

“Voices in the clouds? Fiery letters in the sky proclaiming *I Am the Lord thy God, you insignificant weasel? Then* would you believe?”

He held up his hands, reeling in the face of her anger. “Lee, I didn’t mean—”

“Oh, don’t back down *now*. You’ve been shitting on my beliefs since the day we met. The least you can do is answer the goddamn question.”

“I—well...” Probably not, he had to admit. The first thought that fiery skywriting would bring to his mind would be *hoax*, or *hallucination*. God was such an absurd proposition at its heart that Brüks couldn’t think of any physical evidence for which it would be the most parsimonious explanation.

“Hey, *you’re* the one who keeps talking about the unreliability of human senses.” It sounded feeble even to himself.

“So no evidence could ever change your mind. Tell me how that doesn’t make you a fundamentalist.”

“The difference,” he said slowly, feeling his way, “is that

brain hack is an alternate hypothesis entirely consistent with the observed data. And Occam likes it a lot more than *omnipotent sky wizard*.”

“Yeah. Well, the people you’re putting under your nanoscope know a thing or two about *observed data*, too, and I’m pretty sure their publication record kicks yours all over the innersys. Maybe you don’t know everything. I gotta go.”

She turned to the ladder, gripped the rails so hard her knuckles whitened.

Stopped. Unclenched, a little.

Turned back.

“Sorry. I just...”

“S’okay,” he told her. “I didn’t mean to, well...” Except he had, of course. They both had. They’d been doing this dance the whole trip downhill.

It just hadn’t seemed so *personal* before.

“I don’t know what got into me,” Lianna said.

He didn’t call her on it. “It’s okay. I can be kind of a brain stem sometimes.”

She tried on a smile.

“Anyhow, I *do* have to go. We’re good?”

“We’re good.”

She climbed away, smile still fastened to her face, bent just slightly to the left. Favoring ribs that medical technology had long since completely healed.

He wasn’t a scientist, not to these creatures. He was a baby in a playpen, an unwelcome distraction to be kept busy with beads and rattles while the grown-ups convened on more adult matters. This gift Lianna had brought him wasn’t a sample; it was a pacifier.

But by all the laws of thermodynamics, it did its job. Brüks was hooked at first sight.

He pulled the gimp hood over his head, linked into the lab’s ConSensus channel, and time just—stopped. It stopped, then shot ahead in an instant. He threw himself down through orders

of magnitude, watched molecules in motion, built stick-figure caricatures and tried to coax them into moving the same way. He felt distant surprise at his own proficiency, marveled at how much he'd accomplished in just a few minutes; wondered vaguely why his throat felt so dry and somehow eighteen hours had passed.

What are you? he thought in amazement.

Not computronium, anyway. Not organic. More like a Tystovich plasma helix than anything built out of protein. Things that looked like synaptic gates were ticking away in there to the beat of ions; some carried pigment as well as electricity, like chromatophores moonlighting as associative neurons. Trace amounts of magnetite, too; this thing could change color if it ran the right kind of computations.

Not much more computational density than your garden-variety mammalian brain, though. That was surprising.

And yet...the way it was *arranged*...

He resented his own body for needing water, ignored the increasing need to take a piss until his bladder threatened to burst. He built tabletop vistas of alien technology and shrank himself down into their centers, wandered thunderstruck through streets and cityscapes and endlessly shifting lattices of intelligent crystal. He stood humbled by the sheer impossibility held in that little fleck of alien matter, and by the sheer mind-boggling simplicity of its execution.

It was as though someone had taught an abacus to play chess. It was as though someone had taught a spider to argue philosophy.

"You're *thinking*," he murmured, and couldn't keep an amazed smile off his face.

It actually did remind him of a spider, in fact. One particular genus that had become legendary among invertebrate zoologists and computational physicists alike: a problem-solver that improvised and drew up plans far beyond anything that should have been able to fit into such a pinheaded pair of ganglia. *Portia*. The eight-legged cat, some had called it. The spider that thought like a mammal.

It took its time, mind you. Sat on its leaf for hours, figuring out the angles without ever making a move, and then *zap*: closed on its prey along some roundabout route that broke line of sight for minutes at a time. Somehow it hit every waypoint, never lost track of the target. Somehow it just *remembered* all those three-dimensional puzzle pieces with a brain barely big enough to register light and motion.

As far as anyone could tell, *Portia* had learned to partition its cognitive processes: almost as if it were emulating a larger brain piece by piece, saving the results of one module to feed into the next. Slices of intellect, built and demolished one after another. No one would ever know for sure—a rogue synthophage had taken out the world’s Salticids before anyone had gotten around to taking a closer look—but the Icarus slime mold seemed to have taken the same basic idea and run with it. There’d be some upper limit, of course—some point at which scratchpads and global variables took up so much room there’d be none left over for actual cognition—but this was just a *fleck*, this was barely the size of a ladybug. The condenser chamber was *awash* in the stuff.

What had Lianna called it? God. The Face of God.

Maybe, Brüks thought. *Give it time.*

“Scale-invariant shit it *time-shares*!”

He’d almost gotten used to it by now. Barely even jumped at the sound of Rakshi Sengupta exclaiming unexpectedly at his side. He peeled the hood back and there she was, a meter to his left: eavesdropping on his models through an ancillary bulkhead feed.

He sighed and nodded. “Emulates larger networks a piece at a time. That one little piece of *Portia* could—”

“*Portia*.” Sengupta stabbed the air, stabbed ConSensus. “After the spider right?”

“Yeah. That one little piece could probably model a human brain if it had to.” He pursed his lips. “I wonder if it’s conscious.”

“No chance it’d take *days* just to chug through a half-second brain slice and networks only wake up—”

“Right.” He nodded. “Of course.”

Her eyes jiggled and another window sprouted off to one side: AUX/RECOMP, and the postbiological wonder painted on its guts. “Bet *that* could be though. What else you got?”

“I think it was designed specifically for this kind of environment,” Brüks said after a moment.

“What space stations?”

“*Empty* space stations. Smart mass isn’t anything special. But something *this* small, running cognition-level computations—there’s a reason you don’t run into that a lot on Earth.”

Sengupta frowned. “ ’Cause being a thousand times smarter than the thing that’s trying to eat you isn’t much help if it takes you a month to *be* a thousand times smarter.”

“Pretty much. Glacial smarts only pay off if your environment doesn’t change for a long time. ’Course, it’s not such a bottleneck at higher masses, but—well, I think this was designed to work no matter how much or how little managed to sneak through. Which implies that it’s optimized for telematter dispersal—although if it isn’t using our native protocols, how it hijacks the stream in the first place is beyond me.”

“Oh they figured that out couple days ago,” Sengupta told him.

“Really?” *Fuckers*.

“Know how when you pack a layer of ball bearings into the bottom of a crate and the second layer fits into the bumps and valleys laid down by the first and the third fits onto the second so it all comes down to the first layer, first layer determines all the turtles all the way up, right?”

Brüks nodded.

“Like that. ’Cept the ball bearings are atoms.”

“You’re shitting me.”

“Yah because I got nothing better to do than play tricks on roaches.”

“But—that’s like laying down a set of wheels and expecting it to act as a template for a car.”

“More like laying down a set of *tread marks* and expecting it to act as a template for a car.”

“Come on. Something has to tell the nozzles where to squirt that first layer. Something has to tell the second layer of atoms when to come though so that they *can* line up with the first. Might as well call it magic and be done with it.”

“You call it magic. Hive calls it the Face of God.”

“Yeah. Well, the tech may be way beyond us, but superstitious labels aren’t bringing it any closer.”

“Oh that’s rich you think God’s a *thing* God’s not a *thing*.”

“I’ve *never* thought God was a thing,” Brüks said.

“Good ’cause it’s not. It’s water into wine it’s life from clay it’s waking meat.”

Sweet smoking Jesus. Not you, too.

He summed it up to move it along. “So God’s a chemical reaction.”

Sengupta shook her head. “God’s a *process*.”

Fine. Whatever.

But she wasn’t letting it go. “Everything’s *numbers* you go down far enough don’t you know?” She poked him, pinched his arm. “You think this is *continuous*? You think there’s anything but *math*?”

He knew there wasn’t. Digital physics had reigned supreme since before he’d been born, and its dictums were as incontrovertible as they were absurd. Numbers didn’t just describe reality; numbers *were* reality, discrete step functions smoothing up across the Planck length into an illusion of substance. Roaches still quibbled over details, doubtless long since resolved by precocious children who never bothered to write home: Was the universe a hologram or a simulation? Was its boundary a program or merely an interface—and if the latter, what sat on the other side, watching it run? (A few latter-day religions had predictably answered that question with the names of their favorite deities, although Brüks had never been entirely clear on what an omniscient being would need a computer *for*. Computation, after all, implied a problem not yet solved, insights not yet achieved. There was really only one sort of program for which foreknowledge of the outcome didn’t diminish the point of the exercise, and Brüks had never

been able to find any religious orders that described God as a porn addict.)

So. The laws of physics were the OS of some inconceivable supercomputer called *reality*. At least that explained why reality had a resolution limit; Planck length and Planck time had always looked a bit too much like pixel dimensions for comfort. Past that, though, it had always seemed like angels dancing on the head of a pin. None of it changed anything way up here where life happened, and besides, positing *universe as program* didn't seem to answer the Big Questions so much as kick them down the road another order of magnitude. Might as well just say that God did it after all, head off the infinite regress before it drove you crazy.

Still...

"A process," Brüks mused. That sounded more—modest, at least. He wondered why Lianna had never spelled it out during their debates.

Sengupta's head bobbed. "What *kind* of process though that's the question. Master algorithm defining the laws of physics or some daemon reaching up to *break* 'em?" Her eyes flickered briefly toward his, flickered away at the last instant. "That's how we know it exists in the first place. Miracles."

"Miracles."

"Impossible events. Physics violations."

"Such as?"

"Star formation way below the z-limit. Photons doing things they're not supposed to the metarules changing over by the Cloverleaf Nebula. They vindicated the Smolin model or something I dunno it's beyond me so *you'd* never get it in a million years. But they found something impossible. Way down deep."

"A miracle."

"I think more than one but that's what I said."

"Wait a second." Brüks frowned. "If the laws of physics are part of some universal operating system and God, by definition, *breaks* them...you're basically saying..."

"Don't stop now roach you're almost there."

“You’re basically saying God’s a *virus*.”

“Well that’s the question isn’t it?”

Portia iterated before them.

What was it Lianna had said? *We’ve always thought c and friends ruled supreme, out to the quasars and beyond. What if they’re just some kind of local ordinance?*

“What if they’re a *bug*?” he murmured.

Sengupta grinned and stared at his wrist. “Change the whole mission wouldn’t it?”

“This mission?”

“*Bicameral* mission the mission of the whole Order. Reality’s iterating everywhere but there’re these inconsistencies. Maybe not the *right* reality, mmm? Change alpha a just bit and the universe stops supporting life. Maybe alpha’s *wrong*. Maybe life’s just a parasitic offshoot of a corrupted OS.”

Somewhere in Brüks’s head, a penny dropped.

For fifteen billion years, the universe had been shooting for maximum entropy. Life didn’t throw entropy into reverse—nothing did—but it put on the brakes, even as it spewed chaos out the other end. The gradient of Life was the first scale any aspiring biologist learned to sing: the further you kept yourself from thermodynamic equilibrium, the more alive you were.

It’s the anthropic principle’s evil twin, he thought.

“What—what is this mission, exactly?” Brüks asked softly.

“Mmmm.” Sengupta rocked gently back and forth. “They know God exists already that’s old. I think now they’re trying to figure what to *do* with It.”

“What to do with God.”

“Maybe worship. Maybe disinfect.”

The word hung there, reeking of blasphemy.

“How do you disinfect God?” Brüks said after a very long time.

“Don’t ask me I just fly the ship.” Her gaze slid back to the bulkhead, to the church of AUX/RECOMP and the alien emissary there.

“I think that puppy’s giving them some ideas though,” she said.

Lianna Lutterodt was lost in inner space when he sailed through the Commons ceiling. She blinked as he bounced off the deck, shook her head: her eyes came back to the here and now as a courtesy window opened on the bulkhead. A flatscreen concession to the neurologically disabled.

Icarus. The confessional. A rosette of spacesuited monks, outward facing, visors raised to bare their souls before the Face of God.

“Hi,” Brüks said carefully.

She nodded around a mouthful of couscous. “Rakshi says you made some serious headway. Even gave it name.”

He nodded. “*Portia*. It’s pretty amazing, it...”

Her gaze drifted back to the window. *She can’t take her eyes off them*, he thought, just as she did and caught him looking: “What?”

“It’s not just amazing,” he told her. “It’s actually kind of scary.” He dipped his chin at the feed. “And they cut pieces out of it.”

“They take *samples*,” Lianna said. “Almost like real scientists.”

“Something that reaches down across half a light-year and makes our own machines do backflips around the laws of physics.”

“Not like they can get all the answers by just staring at it all day.”

“I thought that was exactly how they got their answers.”

“They know what they’re doing, Dan.”

“That’s one hypothesis. Want to hear another?”

“I’m not sure.”

“Ever hear of induced thanoparorasis?” he asked.

“Uh-huh.” Lianna shrugged. “Common procedure among the augmented. Keeps ’em from collapsing into existential angst.”

“It’s a bit more fundamental than that,” Brüks said. “Have you got it?”

“Thanoparorasis? ’Course not.”

“Are you going to die?”

“Eventually. Hopefully not for a while.”

“Good to know,” Brüks told her. “Because if you *were* a

victim of ITP, you wouldn't be able to answer that question. You might not even have *heard* it."

"Dan, I don't—"

"You and I"—raising his voice over hers—"we're blessed with a certain amount of denial. You admit you're going to die, you even know it intellectually on some level, but you don't really believe it. You can't. The thought of dying is just too damn scary. So we invent some Fairyland Heaven to take us in after we *pass on*, or we look to your friends and their friends to give us immortality on a chip or—if we're hard-core realists—we just pay lip service to death and decay and keep right on feeling immortal anyway.

"But *some* folks"—he nodded at the feed—"just get too damn smart. They put their heads together and develop insights way too deep to paper over with a few million years' worth of whistling past the graveyard. People like that would *know* they were going to die, they'd feel it in the gut. They'd know what death means in a way you or I never could. And the only way they can keep from collapsing into whimpering puddles is to give denial a hand, cut a cognitive hole into the middle of their heads. We may live in denial most of the time but *those* people—they didn't even show a fright response when it looked like their whole damn hive was an hour from the morgue. Like those agnosiacs who'd die of thirst in their own homes after some tumor's destroyed their ability to recognize water."

"I don't think they're like that," Lianna said softly.

"Sure you do. You told me as much, remember? Reset the sensory biases, randomize the errors."

They watched in silence as the hive poked a stick at something dangerous.

"A lot of them died, not so long ago," Brüks said after a while.

"I remember."

"Me, too. And you know what I remember the most, you know what I can't forget? Luckett rolling around in his own shit while his spinal cord shorted out, smiling and insisting that everything was going according to plan."

Lianna turned away, eyes bright. “I liked him. He was a good man.”

“I wouldn’t know. All I know is, he sounded just like every hapless Yahweh junkie who ever looked around at all the horror and injustice in the world and mumbled some shit about how *It’s not the place of the clay to question the potter*. The only difference is that everyone else lays it all on God’s master plan and your Bicamerals talk about their own.”

“You’re wrong. They don’t think of themselves that way at all.”

“Then maybe you shouldn’t, either. Maybe you shouldn’t have quite so much *faith*—”

“Dan, *shut the fuck up*. You don’t know anything about it, you *can’t* know—”

“I was there, Lee. I *saw* you. They’ve got you so convinced they’re infallible, they’ve got everything so *factored five ways to Sunday* that you didn’t even *need* a hole cut into your brain. You went straight into the lion’s den without missing a beat, you got right up in Valerie’s face and it didn’t occur to you for a microsecond that she’s your goddamn *predator*, she could rip your throat out without even thinking about it—”

“*Do not put that on them*.” Lianna’s voice was flinty. “That was my mistake. Chinedum was—I will *not* let you blame anyone else for my stupidity.”

“Isn’t that the way, though? Isn’t that how it’s always been? Just obey the guys in the funny hats and if it’s a win it’s all *praise be to Allah* but if your ass gets kicked it’s *your* fault. You read scripture the wrong way. You weren’t *worthy*. You didn’t have enough *faith*.”

Some of the fight seemed to bleed out of her then; some of the old Lianna Lutterodt peeked through. She sighed, and shook her head, and ghosted a smile. “Hey, remember when this used to be *fun*?”

He spread his hands, feeling helpless. “I just...”

“You mean well. I know. But after all you’ve seen, you can’t deny how far ahead of us they are.”

“Oh, they’re scary smart, I’ll give them that. They run circles

around the best we roaches can throw at them, they snap this ship like a twig and pitch it all the way to the sun, drop us dead center onto Icarus's dark side from a hundred million kilometers with barely a thruster tweak. But they *glitch*, just like we do. They still *wash away their sins*, because after all that rewiring their brains still mix up sensation and metaphor. They're *more* glitchy than we are, because half their upgrades are barely out of beta—and while we're on the subject, has anyone factored in the neuropsychologic impairment that a few weeks of hyperbaric exposure must be inflicting on all that extra brain tissue?"

Lianna shook her head. "We're not on the steppes anymore, Dan. We don't measure success by how far you can throw a spear in a crosswind. They think rings around us in every way that matters."

"Uh-huh. And Masashi and Luckett are still dead. And all that poor bastard could cling to while his lights went out was that it was all according to *plan*." He put his hands on her shoulders. "Lee, it's not just that these people can't wrap their heads around mortality. They can't even entertain the possibility they could be *wrong*. If that doesn't scare the shit out of you—"

She shook him off. "The plan was to get us to Icarus. Here we are."

"Here we are." Brüks pointed to a hole in the wall, where a hived demigod communed with something that could change the laws of physics. "And how does it feel to know our lives depend on the judgment of something that can't even imagine it could die?"

WARS TEACH US NOT TO LOVE OUR ENEMIES, BUT TO
HATE OUR ALLIES.

—W. L. GEORGE

“WHAT’S RAKSHI GOT against you guys?”

The lights were dimmed, the mutants and monsters were off pursuing their alien agendas, and the Glenmorangie was back on the table. Moore grimaced at Brüks, refriended, over the lip of his glass. “Who’s *us* guys?”

“Military,” Brüks said. “Why’s she got such a hate-on for you?”

“Not sure. Self-loathing, maybe.”

“What’s that supposed to mean?”

“Sengupta’s as much of a soldier as I am. She just doesn’t know it. Not consciously, at least.”

“Metaphorically, you mean.”

Moore shook his head, took another sip; his cheeks puckered as he swirled the single malt around in his mouth. He swallowed. “WestHem Alliance. Same as me.”

“And she doesn’t know.”

“Nope.”

“What’s her rank?”

“Doesn’t work like that.”

“Some kind of sleeper agent?”

“It’s not like that, either.”

“Then what—”

Moore raised a hand. Brüks fell silent.

“I say *army*,” Moore told him, “you think boots on the ground. Drones, zombies, battlefield robots. Things you can *see*. Fact is, if you’ve reached the point where you need that kind of brute force, you’ve already lost.”

Visions of the Oregon desert sprang into Brüks’s head. “Brute force seemed to work just fine for those fuckers who attacked the monastery.”

“They were trying to stop us. Here we are.”

Human bodies, turned to stone. The screams of dying Bicamerals.

Not bodies, he reminded himself. *Body parts*. Here in the dusk of the twenty-first century it was so easy to confuse murder with the amputation of a fingertip. None of the usual definitions made sense when a single supersoul stretched across

so many bodies.

“Suppose you’re a political heavyweight,” Moore was saying. “A mover and shaker, a titan. And down around your ankles are all those folks you never used to worry about. The moved and the shaken. They don’t like you much. They never have, but historically that never mattered. Little people. Back in the day you just ignored them. The business of titans is other titans.

“But now they get into the nodes, they decrypt your communiqués, they hack your best-laid plans. They hate your guts, Daniel, because you are big and they are small, because you turn their lives upside down with a wave of your hand and they don’t care about realpolitik or the big picture. They only care about monkey-wrenching and whistle blowing.

“And you find out about them. You find out about Rakshi Sengupta and Caitlin deFranco and Parvad Gamji and a million others. You give them what they want. You leave the back door open just a crack, so they can see your files on the African Hegemony. You let them sniff out a weakness in your firewall. Maybe one day they find out how to provoke a firestorm in one of your subsidiary accounts, bankrupt some puppet government you kept under your thumb for tax purposes.”

“Except that’s not what they’re doing,” Brüks surmised.

“No it’s not.” There was a hint of sadness in Moore’s smile. “It’s all window dressing. They think they’re really sticking it to you, but they’re being—herded. Into the service of agendas they’d never support in a thousand years, if they only knew. And they’re *dedicated*, Daniel. They’re ferocious. They fight your wars with a passion you could never buy and never coerce, because they’re doing it out of pure ideology.”

“Should you be telling me this?” Brüks wondered.

“You mean, state secrets? What’s a *state*, these days?”

“I mean, what if I tell *her*?”

“Go ahead. She won’t believe you.”

“Why not? She already hates you guys.”

“She *can’t* believe you.” Moore tapped his temple. “Recruits get—tweaked.”

Brüks stared.

“Or at least,” Moore elaborated, “she can’t *believe* she believes you.” He eyed his scotch. “On some level, I think she already knows.”

Brüks shook his head. “You don’t even have to pay them.”

“Sure we do. Sometimes. We make sure they have enough to make ends meet. Let them skim some cream from an offshore account, drop a legitimate contract into their in-box before the rent comes due. Mostly, though, we *inspire* them. Oh, they get bored sometimes. Kids, you know. But all it takes is a little judicious injustice, some new atrocity visited on the little people. Get them all fired up again, and off they go.”

“That seems a bit—”

Moore raised an eyebrow. “Immoral?”

“Complicated. Why herd them into hating *you*? Why not just leave a trail of bread crumbs pointing back at the other guy?”

“Ah. Demonize your enemy.” Moore nodded sagely. “I wonder why we never thought of that.”

Brüks grimaced.

“Rakshi and her kind, they’re wise to the old school. You leak footage showing the slants skewering babies and it’ll take them maybe thirty seconds to find a pixel that doesn’t belong. Discredit the whole campaign. People put a lot less effort into picking apart evidence that confirms what they already believe. The great thing about making yourself the villain is nobody’s likely to contradict you.

“Besides.” He spread his hands. “These days, half the time we don’t even know who the real enemy is.”

“And that’s easier than just *tweaking* them so they flat-out *want* to work for you.”

“Not easier. Marginally more legal.” The Colonel sipped his drink. “A small agnosia to protect state secrets is one thing. Changing someone’s basic personality without consent—that’s in a whole other league.”

Neither spoke for a while.

“That is really fucked-up,” Brüks said at last.

“Uh-huh.”

“So why’s she here?”

“Driving the ship.”

“*Crown’s* perfectly capable of driving itself, unless it’s even more old school than I am.”

“Better to have meat and electronics backing each other up in low-intel scenarios. Complementary vulnerabilities.”

“But why *her*? Why would she agree to work under someone she hated—”

“This mission’s under *Bicameral* command,” the Colonel reminded him. “And anyone in Sengupta’s position would jump at an opportunity like this. Most of those people spend their time babysitting low-orbit crap-zappers from their bedrooms, praying that one of them glitches enough to warrant human intervention. Actual deep-space missions—anything with enough of a time lag to need onboard real-time piloting—those’ve been scarcer than snowstorms ever since Firefall. The Bicamerals had their pick of the field.”

“Rakshi must be very good at her job.”

Moore drained his glass, set it down. “I think in her case it was more a function of motivation. She has a wife on class-four life support.”

“And no way to pay the bills,” Brüks guessed.

“She does now.”

“So they didn’t want the best and the brightest,” Brüks said slowly. “They wanted someone who’d do anything to save her wife.”

“Motivation,” Moore repeated.

“They wanted a *hostage*.”

The soldier looked at him with something that might almost have been pity. “You disapprove.”

“You don’t.”

“You’d rather they picked someone who just wanted to get out of the house? Someone who was in it for the thrills or the bank balance? This was the *humane* choice, Daniel. Celu would have been dead. Now she’s got a chance.”

“Celu,” Brüks said, and swallowed on a throat gone suddenly dry.

Moore nodded. “Rakshi’s wife.”

“What was, um...what was wrong with her?” Thinking: *There’s no chance. It would be one in a million.*

Moore shrugged. “Bio attack, about a year ago. New England. Some kind of encephalitis variant, I think.”

Then you’re wrong. She doesn’t have a chance. She doesn’t. I don’t care how much they spend keeping her heart beating, there’s no coming back from something like that.

Oh my God. I killed her.

I killed Rakshi’s wife.

. . .

It hadn’t been anything radical. It hadn’t even been anything *new*.

The methodology was decades old, a proven tent pole for a thousand peer-reviewed studies or more. Everyone knew you couldn’t simulate a pandemic without simulating its victims; everyone knew that human behavior was too complex to thumbnail with a few statistical curves. Populations weren’t clouds, and people weren’t points; people were *agents*, autonomous and multifaceted. There was always the outlier who ran into the hot zone after a loved one, the frontline medic whose unsuspected fear of centipedes might cause him to freeze at some critical juncture. And since pandemics, by definition, involved millions of people, your simulation had better be running millions of human-level AIs if you wanted to get realistic results.

Or you could piggyback on a preexisting model where each of a million data points was *already* being run by a human-level intelligence.

Game worlds weren’t nearly as popular as they’d once been—Heaven had stolen away those myriad souls who preferred to play with themselves, free of community standards—but their virtual sandboxes were still more than large enough to keep them way out front as the CDC’s favorite platform for epidemiological research. For decades now, the plagues and

sniffles that afflicted wizards and trolls alike had been tweaked and nudged toward specs that made them ideal analogs for the more pedestrian outbreaks afflicting what some still called *the real world*. Corrupted Blood bore more than a passing similarity to ectopic fibrodysplasia. The transmission dynamics of Beowulf's Bane, an exotic glowing fungus that ate the flesh of elves, bore an uncanny resemblance to those of necrotizing fasciitis. Flying carpets and magic portals mapped onto airlines and customs bottlenecks; Mages to jet-setting upper-echelon elites with unlimited carbon ceilings. For a generation now, public health policies the world over had been informed by the lurid fantasy afflictions of clerics and wights.

It was just bad timing that a Realist faction out of Peru figured how to hack that system when Dan Brüks and his merry band were running a sim on emerging infectious diseases in Latin America.

Nobody caught it at the time. The Realists had been subtle. They'd left the actual disease parameters strictly alone: any sudden changes to mutation rate or infectivity would've shown up in the dailies. They'd tweaked the superficial appearance of infected players instead, according to location and demographic. Certain victims looked a bit sicklier than they should have, while others—wealthier PCs with gold and flying mounts at their command—looked a little healthier. It didn't change the biology one whit, but it edged Human responses just a hair to the left. Subsequent outbreaks edged them a bit farther. The ripples spread out of gamespace and into the reports, out of the reports and into policy. Nobody noticed the tiny back door that had opened in the resulting contingency plans until six months later, when someone discovered a suspicious empty vial in the garbage behind the Happy Humpback Daycare Center. By then, a shiny new encephalitis mod had already slipped past Daniel Brüks's first-response algorithms and was carving a bloody swathe from Bridgeport to Philadelphia.

Celu MacDonald had survived unscathed. She'd hadn't even been in the kill zone; she'd been on the other side of the world,

growing freelance code next to the girl of her dreams. Those weren't as rare as they'd once been. In fact they'd grown pretty common ever since Humanity had learned to edit the dream as well as the girl. Soul mates could be made to order now: monogamous, devoted, fiercely passionate. The kind of love that prior generations had barely tasted before their hollow sacraments withered into miserable life sentences, or shattered outright as the bloom faded, the eye wandered, the genes reasserted themselves.

Not for Macdonald and her kind, that empty hypocrisy. They'd ripped the lie right out of their heads, rewired and redeemed it, turned it into joyful truth with a lifetime warranty. First-person sex had even made a modest comeback in the shelter of that subculture, or so Brüks had heard.

He didn't know any of that at the time, of course. Celu MacDonald was just a name on a list of subcontractors, a monkey hired to grow code the academics couldn't be bothered with. Brüks only learned of her after the fact: a bloody little coda at the end of the massacre.

There'd been no conspiracy. No one had thrown her to the wolves. But the academics had had deans and CEOs and PR hotshots keeping their identities confidential, keeping their connections from staining the good names of venerable institutions. Nobody had given any cover to Celu MacDonald. When the dust had finally settled, when the inquiries and ass-covering and alibis had all run their course, there'd she'd been: standing alone in the crosshairs with hacked code dribbling from her hands.

Maybe it had been Rakshi who'd found her, staring slack-jawed at the ceiling after some bereaved next of kin decided to make the punishment fit the crime. She would still have been breathing. The variant didn't kill its victims. It burned them out and moved on; you could tell when it had finished because the convulsions stopped, at long last, and left nothing behind but vegetation.

They'd found the guy who did it, eventually: dead for days, at the center of a micro-outbreak that had imploded under

quarantine. Evidently he'd slipped up. But Rakshi Sengupta was still *hunting*. That was the word she'd used. Denied her revenge on the hand that had pulled the trigger, she was looking for the gunsmith. All that seething anger. All those hours spent trawling the cache. All that implanted idealized love, transmuted into grief: all that grief, transmuted into rage. The growled threats and mutterings about hunting dead men and debts owed and *Some fucker going to be eating his own guts when I get hold of him*.

Rakshi Sengupta didn't know it yet, but she was gunning for Backdoor Brüks.

She was waiting at the mouth of his tent.

"Roach. Got something for you."

He tried to read her eyes, but they were averted. He tried to read her body language, but it had always been a cipher to him.

He tried to keep the wariness out of his voice. "What you got?"

"Just watch." She called a window to the adjacent bulkhead.

She doesn't know. She couldn't know.

She'd have to look into my eyes for that...

"What are you looking at?"

"No—nothing. Just—"

"Look at the *window*," Sengupta said.

I am so sorry, he thought. *Oh God, I am so very sorry.*

He forced his eyes to the bulkhead: an over-the-shoulder view of a diagnostic chair, facing a flatscreen. A tropical savanna glowed there, lit by the grimy yellow light of a fading afternoon (Africa, Brüks guessed, although there were no telltale animals in frame). Telemetry framed the tableaux on every side: ribbons of heart rate, respiration, skin galvanics. A translucent brain scan glowed to the left, writhing with the iridescence of neurons firing in real time.

Someone sat in that chair, almost totally eclipsed by its back. The top of their skull crested above a padded headrest, wrapped in the superconducting spiderweb of a tomo matrix.

The tip of one armrest peeked into view; a hand rested there. The rest of the person existed only by inference. Fragments of a body, almost lost among the bright flayed images of its own electricity.

Sengupta wiggled a finger: the still life began to move. A chrono readout ticked out the time at one second per second: 03/05/2090—0915:25.

“What do you see?” Not Sengupta talking. Someone in the video, speaking offstage.

“Grassland,” said the person in the chair, face still hidden, voice instantly recognizable.

Valerie.

The grasses dissolved into storm-tossed waves; the yellowish sky hardened down to wintry blue. The horizon didn’t change position, though; it still bisected the scene halfway up the frame.

Something tapped faintly on the soundtrack, like fingernails on plastic.

“What do you see?”

“Ocean. Subarctic Pacific, Oyashio Current, early Feb—”

“Ocean’s fine. Basic landscape, that’s all we want. One word.”

A hint of motion, center right: Valerie’s fingers, just visible, drumming against the armrest.

A salt flat, shimmering in summer heat. The edge of a mesa rose in the hazy distance, a dark terrace that split-leveled the horizon.

“What now?”

“Desert.” *Tick...tick tick tick...tap...*

Brüks glanced at Sengupta. “What is—”

“*Shhhh.*”

Same salt flat: the mesa had magically disappeared. Now a skeletal tree rose from the cracked earth, halfway to the horizon: leafless, yellow as old bone, a crown of naked branches atop a stripped featureless trunk almost too straight for nature. The trunk’s shadow reached directly toward the camera, like an unbroken phantom extension of the object itself.

“Now?”

“Desert.”

“Good, good.”

Down in the glass brain, a smattering of crimson pinpoints swept briefly across the visual cortex and disappeared.

“Now?”

Same picture, higher magnification: the tree was front and center now, its trunk straight as a flagpole, close enough to vertically split the horizon and a good chunk of the sky above. The speckles reappeared, a faint red rash staining the soap-bubble rainbows swirling across the back of Valerie’s brain. Her fingers had stopped moving.

“Same. Desert.” There wasn’t a trace of expression in her voice.

Right angles, Brüks realized. *They’re turning the landscape into a natural cross...*

“Now.”

“Same.”

It wasn’t. Now the branches were out of frame: all that remained was the white of the land, the hard crystalline blue of the sky and the hypothetical razor-edged line between, splitting the world side to side. And that impossibly straight vertical trunk, splitting it top to bottom.

They’re trying to trigger a glitch...

No longer a mere rash, glowing across the back of the vampire’s skull: a pulsing tumor. And yet her voice remained empty and untroubled; her body rested unmoving in the chair.

Her face still unseen. Brüks wondered why the archivists had been so afraid to record it.

Now the world on the screen began to come apart. The salt flat behind the tree came *unstuck* just a little at the bottom (the tree stayed in place, like a decal on glass), shrank up from the lower edge of the display like old curling parchment, and revealed a strip of azure beneath: as if more sky had been hiding under the sand.

“Now?”

The desert pixels compressed a little further, squeezed tighter

against the skyline—

“Same.”

—compressed from landscape to *landstrip*, the undersky pushing it up from below, the horizon holding it down from above—

“Now?”

“S-same. I...”

Scarlet auroras squirmed across Valerie’s brain. SKIN GALV and RESP shuddered along their time series.

CARDIAC beat strong and steady and did not change at all.

“And now?”

The ground was almost all sky now. The desert had been reduced to a bright squashed band running across the screen like a flatlined EEG, like a crossbeam at Calvary. The tree trunk cut it vertically at right angles.

“I—sky, I think, I—”

“Now?”

“—know what you’re doing.”

“Now?”

The flattened desert shrank some critical fraction further; horizontal and vertical axes split quadrants of sky with borders of nearly equal thickness.

Valerie began to convulse. She tried to arch her back; something stopped her. Her fingers fluttered, her arms shook against the padded arms of the chair; for the first time Brüks realized that she was strapped into the thing.

Fireworks exploded across her brain. Her heart, so immutably stable until now, threw jagged spikes onto the time series and shut down completely. The body paused for a moment in midconvulsion, frozen in bone-breaking tetany for an endless moment; then the chair’s defibrillators kicked in and it resumed dancing to the rhythm of new voltage.

“Thirty-five total degrees of arc,” the invisible voice reported calmly. “Three-point-five degrees axial. Rep twenty-three, oh-nine-nineteen.” The recording ended.

Brüks let out his breath.

“Has to be real,” Sengupta grunted.

“What?”

“Horizon’s not *real*. It’s, it’s *between*. They don’t glitch on hypotheticals.”

He thought he understood: vampires were immune to horizons. No matter how flat, no matter how perfect, they were zero thickness. You couldn’t build a cross with a horizon, not one that stopped Valerie and her buddies at least: for that, you’d need something with *depth*.

“Really hard to get this,” Sengupta remarked. “The explosion scrambled the records.”

“Explosion?”

“Simon Fraser.”

Realist attack, he remembered. A couple of months before he’d gone on sabbatical; the bomb had taken out a lab working on spindle emulation. He hadn’t heard anything about the vamp program being targeted, though.

“There would’ve been backups,” he guessed.

“For the footage sure. But how do you know it’s *her*, huh? You never see her face. The embeds just give a subject code. Gait recognition not so great when your target’s tied down.”

“The voice,” Brüks said.

“That’s what I used. Now try trawling the cloud with a random voice sample, no stress data, no contextu-als.” Sengupta jerked her chin. “Like I said. Hard. But I got it now it’s getting easier all the time.”

“They tortured her,” Brüks said softly. *We tortured her*. “Does—does Jim know about this?”

Sengupta barked out a humorless laugh. “I wouldn’t tell that asshole what time zone he was in.”

You don’t have to do this, Brüks thought. *You don’t have to work so hard turning all that pain into anger. You could be free, Rakshi. Fifteen-minute tweak and they’d cut the grief right out of you, the same way they wired in the love. Twenty-five minutes and you’d forget you’d ever been in pain.*

But you don’t want to forget, do you? You want the grief. You need it. Your wife’s dead, she’ll be dead forever but you can’t accept that, you’re clinging to Moore’s Law like a life jacket in a

hurricane. Maybe they can't bring her back now but maybe in five years, maybe ten, and in the meantime you'll make do on hope and hate even if you haven't figured out where they belong.

He closed his eyes while she smoldered at his side.

God help me when you do.

Back in the Hub, she'd stripped the sun naked. It seethed and roiled overhead, close enough to touch (which he did, just for the surrealistic hell of it: a gentle push off the grille, a weightless drift, and Daniel Brüks could kiss the sky). But the curve of its edge was as clean and sharp as if razored: no flares, no prominences, no great gouts of plasma to dwarf a dozen Jupiters and fuck with Earthly broadcasts.

"Where's the corona?" he asked, thinking: *Filters.*

"Ha that's not the sun that's the *sun side.*"

Of Icarus, she meant: the sun and Icarus face-to-face, the light of one bouncing off the disk of the other into the eye of some remote camera, massively shielded, floating out front on the breath of a trillion hydrogen bombs.

"Perfect reflector if you crank it up high enough," Sengupta said. "Won't do much for the rads but if you're talking about thermal and visible spectrum I could turn this place into the coldest spot from here to the Oort."

"Wow," Brüks said.

"That's nothing look at *this.*"

The sun—the sun's reflection—darkened by degrees. Those brilliant writhing coruscations began to dim: the sunspots, the weather systems, the looping cyclones of magnetic force began to fade from sight, sink into some colder cosmic background. Within moments the sun was a pale phantom on a dark mirror.

Something else was there, though: other currents, convecting like a pot of molten glass brought to a rolling boil. Liquid mass upwelled near the center of the disk, swirled outward in an endless bloom of turbulent curlicues, cooled and slowed and stagnated near the darker perimeter. It was as though the solar photosphere had been stripped away to reveal some other,

completely separate weather system churning beneath.

Except, Brüks realized after a moment, he wasn't looking at the sun at all, not even in reflection. This was—

"That's *Icarus*," he murmured. A great convex solar cell a hundred kilometers across: transparent or opaque, solid or liquid, its optical properties slaved to the whims of a glorified thermostat and Rakshi Sengupta's little finger. Darker now, just a few degrees closer to blackbody status, the convection currents swirled ever faster as it worked to dump the excess heat.

Off in some distant corner, an alarm woke with a soft beeping.

"Um..., " Brüks began.

"Don't worry roach just throttling up a bit to build some extra ergs don't want Earth to fall below quota do you?"

The beeping continued, increasingly urgent. Insistent little tags began flashing near the bottom of the display, albedo falling, absorbance and ΔT on the rise.

"I thought we'd already tanked up." It had been the final phase of the reconstruction: the last of the Bicams had stowed their tools and abandoned the *Crown's* refitted hull for a group hug around *Portia*, twelve hours before. (Apparently their brains fell out of contact beyond some limited range.)

"Got *some* need *more* that's a lot of mass we gotta get out from under."

Brüks couldn't take his eyes off the sunside view: like looking down at a blooming mushroom cloud in the wake of an airburst. He knew it was only imagination but the Hub felt—*warmer...*

He bit his lip. "Aren't we overheating? Those tags—"

"More product takes more power right? Basic physics."

"Not *that* much more." Surely she hadn't dialed down the reflectivity this far the last time, surely this was just—

"Want to double-check my numbers roach? Don't trust my math think you can do better?"

—showing off...

The sunside sparked and vanished from the dome: NO SIGNAL

pulsed above the warning icons left behind.

“*Shit*,” Sengupta spat. “Stupid cambot melted.”

“I’m impressed,” Brüks said quietly. “Now will you *please* just dial it back a—”

“Quit fucking around, Rak.” Lianna ricocheted up from the southern hemisphere, bounced off the Tropic of Cancer and arced toward the forward hatchway. “We’ve got more important things to do right now.”

“Yeah right more important than putting charge in the tank.” But her fingers twitched in the air, and the alarms dimmed a little. “Like what?”

Lianna spun around a handhold and planted herself on the arctic circle. “Like Oldschool’s slime mold. It’s talking to us.” And disappeared through magnetic north.

THE QUICKEST WAY OF ENDING A WAR IS TO LOSE IT.

—GEORGE ORWELL

TALKING WAS GENEROUS: the images that had begun crawling across *Portia*’s skin were crude, chunky things, primitive mosaics built from pixels a centimeter on a side. There was no window per se, no distinct bounded area within which relevant information was neatly displayed. The mosaics simply faded into existence and out again, the oily gray of default epidermis stippling gradually into a roughly circular area of increasing contrast, a black-and-white scratchpad reminiscent of a crossword puzzle. Brüks’s secular circuitry couldn’t discern any pattern there.

Chromatophores, he remembered. *This thing could change color if it ran the right kind of computations.* “What started it up?”

“Dunno don’t bug me.” Sengupta had demoted the helmet-cam feeds to a line of thumbnails; her attention was fixed on Icarus’s own stereocams, zoomed and focused on *Portia*’s—what? Graphics interface? The same picture respawned in

several iterations across the dome: sonar, infrared, ultrasound. The mosaic only showed up along visible wavelengths: infrared and ultraviolet filters showed nothing but plain old *Portia*, a monochrome porridge devoid of surface detail.

Smack-dab in the middle of the human visual range, Brüks thought. *Wouldn't that be a coincidence...*

"Ha!" Sengupta barked. "Z-contours the thing's talking in *terraces...*" She zoomed the view. Sure enough the white pixels were *elevated*, little square mesas raised a millimeter above their darker counterparts. Brüks spawned his own window and zoomed even closer: the surfaces of all that topography were *fracturing*, folding, each pixel splitting and resplitting into a mesh of ever finer pigeonholes.

"It's building *diffraction gratings!*" Sengupta brayed.

"And it's increasing pixel-res—"

"I said shut up!"

Brüks bit back a response and cycled through MonkCam. The Bicamerals had fallen silent around the object of their veneration, played with their instruments, passed bands of radiation invisible and otherwise over *Portia's* skin. Lianna was staying out of the way; her camera panned across the backs of helmets from the compartment hatch.

The resolution on that patchy window was improving by the second now; pixels the size of thumbnails shattered into spots the size of lentils, dissolved again into swirling clusters of pinheads that collapsed into shards below the resolving power of the camera. Steps became sawtooth lines became smooth, swirling curves that swept across the display and faded into flat gray oblivion. Now Brüks could almost recognize the patterns moving there—each new geometry seemed more familiar than the last, tugged a little harder at some half-forgotten memory before giving up and giving way to the next iteration. But nothing stuck. Nothing lasted long enough to sink his teeth into—until the patterns slowed, and Rakshi and Lianna spoke a single word, a shout and a whisper uttered in the same instant:

"Theseus."

Eleven minutes was all it had taken. Eleven minutes for an anaerobic time-sharing slime mold to refine its pixels from the size of sugar cubes down to units that exceeded the resolving power of the human eye. Eleven minutes from coma to conversation.

First-contact protocols. Fibonacci sequences, golden ratios, periodic tables. The Bicamerals scribbled cryptic responses onto tacpads and held them up in turn; Brüks was not especially surprised to note that *Portia's* swirling communiqués were a lot more comprehensible than the Bicamerals' responses.

A shadow intruded subtly from the direction of the hatch, a hint of some presence beyond the lines of sight offered up by helmet feeds and onboard eyes. Icarus was full of blind spots; its cameras had not been installed with an eye to comprehensive surveillance. Brüks noticed, and tried not to.

Sudden surprised murmurs from the Bicamerals; a soft *oooh* from Lianna. Brüks scanned the feeds, where geometric primitives acted out some arcane theorem across *Portia's* skin. "Lianna. Talk to me."

"The GUI," she told him. "It's gone *three-D*." Her feed circled the compartment, fixing *Portia* from every angle. "Some kind of lenticular diffraction effect. I'm seeing that whole display in three-D, we're *all* seeing it in three-D. Wherever we move. The thing's *tracking* us, it's tracking five—uh, six pairs of eyes and pointing a customized diffraction grid at each one of us *simultaneously*. A *single display surface*."

"Doesn't look three-D to *me*," Sengupta grumbled. "Too dumb to track the stereocam."

Eleven minutes to derive the precise architecture of human eyesight. It seemed an impossibly short time to intuit a whole new sensory system from scratch, without invasion, without dissection. Except *Portia* hadn't done that at all, most likely. It had probably taken the tutorials long before it ever made the in-system jaunt. Wherever the place it called home, it had at the very least made a pit stop at *Theseus*. These probably weren't the first Humans it had encountered.

Maybe there'd been some dissection after all.

“Where’s Jim?” Lianna said.

“Right here,” Moore called in from the depths of the *Crown*. He’d been off-shift but he was back in the game. “I’m on my way.”

“Uh, that’s a negative, Jim. We’d rather you stay back for now. Give us your insights from there.”

“Why’s that?”

“You know why. This thing’s using *Theseus*’s contact protocols. Your stock just went up.”

“That’s ridiculous,” Moore said mildly. “I’ve been over there many times.”

“It was never *active* before.” The slightest hint of exasperation tinged Lianna’s voice. “Come on, Jim, you know the rules about high-value assets better than anyone.”

“I do,” Moore agreed. “Which means my expert opinion should prevail. I’m coming over.”

No sound over comm. On the great surveilling compound eye, points of view shifted and bobbed.

“Fine,” Lianna said at last. “Don’t forget to suit up.”

Brüks and Sengupta, the last of the daycare buddies. They watched through one camera eye as Moore, fore in the attic, slid into his suit. They watched through a half-dozen others as Ofoegbu et al returned to their rituals at the altar of First Contact, as *Portia* continued to iterate through stolen protocols; Sengupta grunted something about building a pidgin but all Brüks could see was plasma plots and dancing stick figures.

“Little warm in there,” Sengupta remarked. Brüks barely heard her.

Up in one corner of the compound eye, one of the Bicamerals—AMINA, according to the feed—panned away from the shrine and floated out of the sanctum; EULALI followed a moment later. The two began to trace a path back to the docking hatch. (Brüks felt a twinge of resentment on Moore’s behalf—as though the poor dumb caveman might get lost without a couple of grown-ups to show him the way.)

Metal guts sailed past in Moore's feed: grilles, bulkheads, conduits and plumbing turning around his axis in constant lazy rotation. Landmarks passed in faster succession than Brüks had ever seen through Bicameral feeds: the radiator bus, the T-junction leading off to the LEAR hoop, that row of fluorescent pink high-pressure tanks he'd never been able to find on any schematic. Moore moved as if he'd been born to this place; he rounded one last corner like a dolphin twisting onto a new heading and he was *there*. Lianna and Ofoegbu moved aside to let him enter.

Somehow he'd missed Amina and Eulali. *Probably took a short cut*, Brüks thought, glancing up at the nondescript passageway floating past in their feeds. *That'll teach 'em*.

Soft ululations from the sanctum. On Lianna's feed Moore frowned stage left, evidently squeezing some kind of intelligence from those sounds.

"I think I see the problem," he said after a moment.

Somewhere—else—Eulali and Amina had stopped moving. They hesitated for a moment, looming in each other's feeds; then Janused back-to-back, turning slowly. Signage and hazard striping adorned a hatch in the background: VPR H₂ STORAGE, THRUSTER ASSEMBLY. HARD VACUUM BEYOND.

"It's as you said," Moore was saying back in the sanctum. "These are *standard* protocols." His helmet cam held a tight focus on *Portia's* paintings. Lianna's feed showed him from the side, visor raised, cheek eclipsed by his helmet, his profile visible past the forward edge of the seal. Just past him, the node called Ofoegbu wasn't looking at Moore *or Portia*: he was looking back through the open hatchway, into the corridor beyond—

Wait a second, Brüks thought. *Shouldn't there be—*

That shadow, hinting at an unseen presence by the hatch. Gone now.

Moore: "It's using the same protocols we are."

Valerie had been there, just a few minutes ago. Now she was gone.

"It's reflecting our own protocols back at us. It's completely

rote.”

Amina and Eulali. They weren't going to meet Jim at all, Brüks realized. I bet they're tracking Valerie...

He foregrounded their feeds. They still faced in opposite directions, each presumably sharing in the wraparound vista of a conjoined visual field. Icarus drifted about them like a sharp-edged dream.

“We’re not talking to an alien intelligence,” Moore continued. “We’re talking to a mirror.”

Something caught Brüks’s eye, a tiny bright sparkle in the upper-left corner of Amina’s feed. A faint star drifting on the recycled breeze. He skimmed the stereocam menu, selected 27E—VAPOR CORE REACTOR—EXT. CORRIDOR. Same corridor, dorsal view. Now he stared down at the tops of two open helmets; that floating star twinkled in the foreground. He zoomed the feed onto a sliver of glass—something like that, anyway—barely the size of a hangnail. A shard of something *broken*.

A big place, Icarus. It went on forever, breathed through more than a thousand kilometers of ductwork. This glass speck could have come from anywhere.

“You want to make any progress at all—” Moore said.

No signs of stress or metal fatigue nothing popped nothing broken no bits floating around.

...’Course you gotta go in there and check to be sure...

“—you’ve got to break it.”

In the sanctum, Jim Moore extended his arm. Too late, Ofoegbu rushed to intervene. A bright little figurine sprang into existence on the palm of Moore’s hand, a hologram, an offering in the shape of a man.

“This is my son.” Moore’s voice carried soft and clear along the channel. “Do you know him?”

Portia’s interface imploded and disappeared.

Holy shit holy shit—“Holy shit holy shit holy—” That was Sengupta beside him, locked in a loop, synced with another voice in Brüks’s own head.

“Shut up,” Brüks said; amazingly, both obeyed.

Moore’s hand didn’t move. The offering on its palm glowed

steadily. *Portia* lay silent on its shrine while every sapient being within a hundred million kilometers held its breath.

After an endless moment, a single bright eye opened in the middle of that surface. Light spilled from its pupil, fountained swirling across some canvas of melanin and magnetite, settled finally into an image with arms and legs. Siri Keeton looked back at himself, arms spread just slightly at his sides, palms out.

Brüks leaned forward. “Another mirror image.”

Sengupta clicked and ticked and shook her head. “Not a mirror look at the *hand* the right *hand*.” She zoomed the feed to make it easy: a ragged line there, from the heel of the palm right up to the webbing between the index and ring fingers. As if something had torn Keeton’s hand apart, right down to the wrist, and glued it back together.

Brüks glanced at Sengupta, trying to remember: “That’s not on Jim’s—”

“Of course not that’s the whole fucking *point* isn’t—”

A sudden strangled sound from somewhere in the network: Bicameral sounds, a host of complex harmonics that probably held volumes. All Brüks could decipher there was surprise: over at 27E—EXT. CORRIDOR. Eulali was charging up the passageway at full speed. Amina floated transfixed, staring straight at the camera—no, not at the camera. At that telltale shard floating in front of it.

Everywhere, suddenly: pandemonium.

The helmet feeds at the shrine were all in frantic motion, swinging like drunken pendulums and sweeping the scenery too fast to make out whatever had scared them. Off down 27E Eulali bounced off a bulkhead (Wait a second; had there even *been* a bulkhead there a moment ago?) and retreated back toward Amina; another instant and both were gone from third-person view, lost but for the frantic blurry sweep of their suit cams. Sengupta grabbed AUX/RECOMP and spread it front and center across the dome, a top-down view of the shrine and its resident deity and its misbegotten acolytes caroming off solid metal where an open hatchway had gaped only a few moments before. *Portia* lay quiet as clay along the condenser, its subtle

mutilation of Siri Keeton glowing soft and steady as a child's nightlight: the oily gray tentacle that lashed out toward Chinedum Ofoegbu sprouted from the far bulkhead, and Moore barely had time to push the monk out of the way.

All in those final furious moments before the feeds went dark.

Sengupta gibbered faintly to port. Brüks barely heard her. *I know what that is*, he thought as those last seconds played over in his head. *I've seen these before, I've used these before, I know exactly what this is...*

Magnetite and chromatophores and crypsis. Cages broken and painstakingly rebuilt. Footprints wiped clean, disturbing alien smells erased, sensors and samplers carefully planted and natural habitat reconstructed along all axes.

This is a sampling transect.

He yanked the quick-release buckle on his harness, floated free. "We've got to get them out."

Sengupta shook her head so hard Brüks thought it might come off. "No fucking way no fucking way we gotta get *outta here*—"

He spun above the mirrorball, grabbed her by the shoulders

—"Don't fucking touch me!"—

—let her go but kept close, face-to-face, mere centimeters between them though she squirmed and turned her face away: "It doesn't know we're here, do you understand? You said it yourself, *too dumb to track the camera too dumb to know we're here*, they never let us onto Icarus so *it's never seen us*. We can take it by surprise—"

"Roach logic that's *stupid* that doesn't mean *anything* man we gotta *leave*—"

"*Don't leave*. Do you hear me? Stay here if you want but *don't you fucking leave* until I get back. Boot up the engines if the damn things even work yet, but *stay put*."

She shook her head. An arc of spittle spread from her lips and fanned through the air. "What are *you* gonna do huh they're *ten* times smarter than you and they never even saw it coming—"

Good question. "In some ways, Rakshi. They're ten times

dumber in others. They know all about quarks and amplituhedrons but they didn't get nailed by a piece of quantum foam, do you understand? They got nailed by a goddamned *field biologist*. And that's a game I know inside out."

He cupped her head in his hands and kissed her on the crown

— "Don't leave." —

— and leapt into the attic.

He shot through the rafters like a pinball, bouncing from strut to handhold, knocking aside straps and buckles and glistening blobs of oily water that splattered on contact. Brüks the baseline. Brüks the roach. *Give it up, Danny-boy: don't even try to think, you'll only embarrass yourself in front of the grown-ups. Just nod and swallow what they feed you. Keep your mouth shut when Sengupta brushes off a discrepancy of a few millimeters as insignificant thermal expansion. Play it safe when Moore points out that Portia, wonder of wonders, grows; point to a puddle of candle wax on the machinery and dismiss it with a shrug. Don't bother wondering whether the infiltration really stopped at such an obvious border. Forget that Portia computes and pattern-matches, forget its capacity to build mosaics of such intricate resolution that no meatball eye could tell the difference between a naked bulkhead and one sheathed in the thinnest layer of thinking plastic. Don't let the results of your own half-assed research point you to the obvious: that Portia might coat everything like an invisible intelligent skin, that it's there between whenever anyone boots up an interface or turns on the goddamn lights: watching everything we do, feeling every sequence our fingers tap against the panels. Just sit back and smile as the adults blunder innocently into an alien cage painted inside the man-made one.*

And when the traps snaps shut and all those pieces come together you can comfort yourself that the grown-ups didn't see it, either, that these brain-damaged groupthink Bicamerals aren't so smart after all. You can die smug and vindicated with the best of them in a mass grave swinging around the sun.

The lamprey gaped ahead and to port, highlighting edges and angles in blue pastel. Three empty spacesuits floated in their alcoves. Brüks considered and dismissed them in an instant: by the time he wriggled into one of those things, everyone on Icarus might be pickled in whatever *Portia* used for formalin. Up past the 'lock, though, encircling the forward reaches of the docking bay: an array of tools sufficient to cut a ship in two and build it back again.

Portia could obviously lock its molecules into something like armor: Ofoegbu was not a small man and yet the slime mold—stretched thin across the hatch, drawn tight in seconds—had bounced him back into the compartment without even bending. But Brüks had seen this fucker from the inside, close up. He'd seen the pieces that let *Portia* talk, and think, and blend in; he had a least a rough idea of how those parts were structured and what they were made of.

He was pretty sure they couldn't all be fireproof.

He yanked a welding laser from its mount and pulled himself aft, flipping off the safety and wrapping the tether around his wrist as he moved. An electric insect whined faintly up toward the ultrasonic as the capacitors charged.

Down the lamprey's throat: a glowing semiflexible trachea, reinforced by skeletal hoops at three-meter intervals. Soft padded striations extending the length of the passageway, the ligaments and muscles that moved the tunnel during docking. A biosteel frame hove into view around the curve, a massive square hatch embedded within: Icarus's main airlock, sealed and solid as a mountain, reassuringly industrial after all this squishy biotecture.

Pressed into the alloy off to the side, a handle nested within a crimson dimple. Brüks grabbed it, braced himself with one foot to either side; turned; pulled. The dimple turned green around his fist. The airlock sighed open. He grabbed its edge, swung it back, ignored the yellow flashing of nervous smart paint warning against DUAL HATCH DISCONNECT: stared through an open inner hatch into the labyrinth beyond.

Enemy territory. He had no way of knowing how far it

extended. Maybe *Portia* was looking back at him now.

He hefted the welder and pushed off.

No animatics to guide him. No convenient schematics rotating in his head, no bright icon to pinpoint his location. He remembered the way from a dozen suit feeds, from his own solitary voyeurism. He didn't know how useful those memories might be. Maybe they were as reliable as any roach's. Maybe the very architecture had changed.

Gross anatomy would get him to the sanctum: down the longitudinal notochord, right fork past the LEAR hoop, turn right again under the coolant nexus. If he was lucky, someone would be making sounds to guide him the rest of the way.

Should've grabbed a helmet, he thought, looking backward with perfect clarity. *Should've brought something with a comm link. An extra laser or two for Jim and the boys.*

Shit shit shit.

Sounds ahead, sounds to starboard, sounds behind: a glimpse of motion from the corner of his eye as he sailed past some side tunnel that had never made it onto his mental map. He grabbed at a passing rib; the laser sailed on, yanked him forward by the wrist, pulled him off balance and sent him tumbling into the bulkhead. His head cracked painfully against a strut; the laser, jerking at the end of its strap, recoiled through weightless space and punched him in the chest.

Shouts from behind. A small chorus of wordless, panicky voices. An almost electrical *slithering* sound.

Brüks cursed and launched himself back the way he'd come. The forgotten passageway slid toward him; he braked, grabbed, swung around the corner—

—and nearly ran headlong into a wall congealing before him like a membrane of living clay.

In the time it took him to stop and gibber to himself—

—*I almost touched it I almost touched it It almost got me—*

—the membrane had transmuted to biosteel, rigid and impenetrable and almost thick enough to muffle the sounds of carnage on the other side.

Not biosteel, Brüks reminded himself. *Not impenetrable.*

Not fireproof.

He brought up the welder.

No. Not fireproof at all.

Portia squirmed where the beam hit, curled and blackened and iridesced like an oil slick. Brüks kept the focus tight, the beam as steady as free fall and nerves could keep it. It burned through, opened a hole that dilated like an eye: stretched elastic tissue split apart, recoiling from the hit. The beam weaved briefly, scoring inert metal on the other side, barely missing one of the figures beyond before Brüks's killed the circuit.

And stopped, blinking.

Taken in during that endless, frozen moment: a tunnel with no deck and no ceiling, its walls buried behind an infestation of pipes and conduits, capped by a T-junction ten meters in. Five spacesuited figures, helmets open, halfway down that length. At least one shattered visor: a cloud of coppery crystal shards following their own small trajectories, some polished as new mirrors, others stained and splattered by a band of crimson mist that arced from a small silvered body turning in midair. Brüks knew who it was even before the face came into view, even before he saw those sightless eyes staring bone-white from a black mask.

Lianna.

The others moved under their own power. Amina, making desperately for the faint hope Brüks had just opened before her. Evans, flailing through the carnage in search of a handhold or a brace point, finding only the rag-doll embrace of a corpse entangled in passing. Azagba, the legless zombie: lashing out quick as a striking snake, spinning Amina around by the shoulder, driving the straightened fingers of one bladed hand pistonlike into her open helmet and turning her *off* in an instant. Another of Valerie's zombies bounding forward like something arboreal, reaching out after Evans to do the same.

Brüks fired the torch. The zombie saw it coming and twisted like an eel but she was trapped in midair, purely ballistic, wed to inertia for just that instant too long. The beam bounced

briefly off her silver abdomen, flash-burned a slash of cauterized charcoal across her exposed face. Amazingly she stayed on target: burned and half-blind, one eye boiled and burst in its socket, she lashed out and crushed Evans's throat in passing, bounced off metal viscera, grabbed the nearest handhold without even looking.

Portia was there, too. It felt the clasp and returned it, wrapped glistening waxy pseudopods around that hand faster than even zombie reflexes could respond. Wisps of white vapor swirled at the seams where suit and slime fused together. The trapped zombie looked down with one dead dancing eye; but when she raised her head again there was something else in that face.

"*Jesus,*" she breathed. She doubled over in a great wracking cough, hand embedded in the wall; blood and spittle swirled around her face. "What am I—oh God, what's—"

The light faded in her eye; the tics and stutters that reasserted themselves seemed dead even by zombie standards, the twitch of dying cells released on their own recognizance.

Jim would know your name, Brüks thought.

Something moved past her shoulder, past the drifting bodies, way down at the T-junction: behind the crack in the closet door, down in the space beneath the bed. Another glint of silver, moving with silent purpose: another figure, rounding the corner.

Valerie.

For a moment they stared at each other across a litter of corpses: predator with a look of distracted curiosity, prey because he simply couldn't look away. Brüks didn't know how long the moment lasted; it might have gone on forever if Valerie hadn't lowered her faceplate. Maybe that was an act of mercy, the breaking of a headlight paralysis that would have kept him frozen right up until she tore him limb from limb. Maybe she just wanted to give him a sporting chance.

Brüks turned and fled.

Coolant clusters. Service tunnels. Sealed hatches leading to far-off places he'd never explored or long-since forgotten. He

passed them unseeing, let instinct steer the meat while his global workspace filled with predator models and pants-pissing terror. He was passing a tertiary heat sink and he could see Valerie closing through the back of his head; he was at the Cache Hatch and he could see her lips drawn back in that gleaming predatory grin; he was fleeing up the notochord and he could feel her muscles bunching for the final killing blow.

In the lamprey now: *No time to stop, no chance to bar the way, you even think about dogging that hatch and she'll be on you before you even turn around. Don't look back. Just keep running. Don't think about where, don't think about when: thirty seconds is a lifetime, two minutes is the far future, it's the moment that matters, it's now that's trying to kill you.* A voice ahead, as panicky as the one inside, echoing down the throat and getting louder: all *shit shit shit* and *docking clamps* and numbers going backward—but *Don't worry about that, either, that's for later, that's for ten seconds from now if you're still alive and—*

The Crown.

End of line. Nowhere else to go, no more time to buy. All the future you have, right now.

Nothing left to lose.

Brüks turned and stared back down the throat; Valerie stood there, casually braced against the lip of Icarus's inner hatch, looking up through the mirrored cyclops eye of her helmet. She might have been standing there for hours, just waiting for him to turn around and notice her.

Now that he had, she leapt.

He brought up the laser and *sarled*. Valerie sailed toward him; Brüks could have sworn she was laughing. He fired. The beam scattered off the reflective thermacele of the vampire's spacesuit, shattered into myriad emerald splinters bright as the sun. They scorched split-second tracks on random surfaces before Valerie darted out of the way.

Brüks lunged for the hatch controls, grabbed the lever, fumbled. The Crown clenched her front door a fraction, relaxed it again. Valerie closed for the kill, arms outspread. Somehow he could hear her: a mere whisper, impossibly audible even

over Sengupta's panicked chanting on comm. A voice as clear as if she were murmuring at his shoulder, as if she were right inside his head:

I want you to imagine something: Christ on the Cross...

Electricity sang, deep down in his bones. Synapses snapped like blown circuits. Brüks's flesh hummed like a tuning fork, every muscle thrown instantly into tetanus. Wet warmth bloomed at his crotch. He couldn't move, couldn't blink, could barely even breathe. Some distant part of him worried briefly about that last fact, then realized that it probably didn't matter. Valerie was bound to kill him long before he had a chance to suffocate.

In fact here she came now, reaching out—

—and careening away, struck from behind. Jim Moore loomed up in her stead, his face utterly reptilian, eyes dancing frantic little jigs in the dark cavern of his open helmet. He pushed Brüks into the bay, slammed the airlock shut behind them both; his fist came down on Brüks's chest not quite hard enough to crack the sternum through the suit. Something broke in there, though; something *unlocked*, and Brüks was sucking back great tidal washes of recycled air. By the time he stopped gasping Moore had webbed him into an empty alcove for safekeeping, an occupied suit next to empty ones.

There were plenty of those.

The *Crown* was a symphony orchestra, warming up: the creak and groan of stressed metal, the distant cough of awakening engines, the random percussion of buckles clanking against bulkheads pushed into grudging motion. Sengupta's vocals, crackling out panicked numbers. A rogue droplet of oil floated in place while the ship shifted around it, splashed against Brüks's cheek with a whiff of benzene.

From somewhere very far away, the roar of an ocean.

Moore's hands brought up an interface on the bulkhead. His fingers played those controls with inhuman precision. A window opened to one side, an exterior feed rendered in smart paint: a smear of ragged blue light lashing back and forth, the lamprey torn free and recoiling into some distant burrow. A

play of stars and shadow and knife-edged geometries blocking out the heavens. Dim red constellations flashed along wire-frame gantries: cliffs of black alloy stretched far and wide to their own horizons.

Valerie's helmet, blocking the view. Fists pounding against the hull, any possible sound drowned out by the vibration of the engines. *Sunrise*, sudden and scalding: the whole universe burst into flame as the *Crown of Thorns* lumbered out of eclipse. Somewhere Sengupta was cursing; somewhere else, thrusters fired. For one brief instant Valerie was a black writhing shadow against a blinding sky: then burst into flame an instant before the pickup fried.

Moore's fingers never stopped dancing.

It took endless seconds for the backup camera to kick in. By the time it did they were back in hiding, huddled in Icarus's shadow, the starless black silhouette of the radiator spire sliding past to port. A gentle hand began to nudge Brüks down against the bottom of the alcove, mass-times-acceleration pulling him out against the webbing. The dim zodiac of the array's streetlights receded slowly to stern—but other lights ignited back there as he watched, a pentagon of hot blue novae flaring silently in the darkness. It was only then that another silence registered: Moore had stopped talking to the wall, stilled the machine-gun staccato of his fingers against metal. Brüks could barely make out a fuzzy shape at the edge of vision; it took a Herculean effort to move his eyes even a fraction of a degree, to bring the Colonel into focus. He never did succeed completely. But he squeezed enough from his peripheral vision to see the old warrior standing still as stone against the deck, one hand half-raised to his face. He thought he heard a soft intake of breath caught halfway, and decided to call it the sound of a returning soul.

Icarus shrank away. The sun burst back into view around it. Five blue sparks still flickered even in the light of that blinding corona: five bright dots in a dwindling black disk in a sea of fire. *Stabilizing thrusters*, Brüks realized distantly, and wondered why they burned so long and so bright, and wished that the

answer hadn't come to him so quickly.

The newborn gravity kept putting on weight. It pulled Brüks ever harder against his restraints, leaned him out of the alcove and angled over the deck. His knees did not buckle under the strain; his body did not collapse. He was breathing statuary, and some gut sense stronger than logic knew that he would not crumple if those straps gave way: he would topple to the deck and *shatter*.

The spacesuits beside him had disappeared. Rotting corpses hung in their stead, slivers of gray flesh dangling through the mesh, maggots dripping like rice grains from empty eye sockets. Grinning mandibles clicked and clattered and uttered incomprehensible sounds. *REM paralysis*, one part of Brüks said to another, although he was not asleep. *Hallucination*. The corpses laughed like something less dead, coughing through mud.

Floaters swarmed in his eyes. Half-visible in the encroaching fog, Jim Moore stood against the deck without benefit of webs or incantations or anything but the crushing awareness of his own actions. Darkness closed in. With the last few synapses sparking in his cache, Brüks wondered what Luckett might have said in the face of such a toll.

Probably that everything was going according to plan.

PREDATOR

You have to understand, Deen, this is the fifth attack on Venezuela's jet-stream injection program so far this year. Stratospheric sulfates are *still* down by three percent and even if there aren't any further attacks, we'll be lucky if they recover by November. Any agro who can't afford seriously drought-hardened transgenics is going to have a disastrous summer. Clones and force-grown crops from higher lats should be able to pick up the slack—as long as we don't suffer a repeat of last year's monoculture collapse—but local shortages are pretty much inevitable.

We're well aware that the Venezuelan program is technically illegal (you think none of us have read the GBA?) but I don't have to tell you about the benefits of stratospheric cooling. And even if geoengineering is a short-term solution, you gotta use what you can or you don't live long enough to reach the long term. Of course, Caracas isn't doing itself any favors with their idiotic adherence to an outmoded judicial system. Personal culpability? What are these [EPITHET AUTOREDACT] going to come up with next, witch-dunking?

So I can speak for the whole department when I say that we sympathize completely. And if you folks over in Human Rights want to blacklist them again, go right ahead. But the bottom line is, *You can't ask us to withdraw support for Venezuela.* The world just can't afford to see even modest climate-mitigation efforts sabotaged like this.

I know how bad the optics are. I know how tough it is to sell an alliance with a regime whose neuropolitics are rooted in the Middle Ages. But we're just going to have to take this dick in our mouths and swallow whatever comes out. Stratospheric cooling is one of the few things keeping this planet from falling on its side right now, and as you

know that technology takes a *lot* of power.

If it makes you feel any better, consider the fact that if this had happened twenty, twenty-five years ago we wouldn't even be having this conversation; we didn't have enough joules in hand back then to be able to afford these kinds of options. We'd probably be tipping into another Dark Ages by now.

Thank God for Icarus, eh?

—Fragment of internal UN communiqué
(correspondents unknown): recovered from
corrupted source released during a scramble
competition between unidentified subsapient
networks, 1332:45 23/08/2091

I HAVE NEVER FOR ONE INSTANT SEEN CLEARLY WITHIN
MYSELF. HOW THEN WOULD YOU HAVE ME JUDGE THE
DEEDS OF OTHERS?

—MAURICE MAETERLINCK

HE WOKE UP weightless. Unseen hands guided him like a floating log through the Hub, through a southern hemisphere that didn't move any more than he could. Rakshi Sengupta called in from somewhere far away, and she did not bray or bark but spoke in tones as soft as any cockroach: "This is taking too long we're gonna start falling back if we don't restart the burn in five minutes tops."

"Three minutes." Moore's voice, much closer. "Start your clock."

And that's all of us, Brüks thought distantly. Just Jim, and Rakshi, and me. No vampires left, no undead bodyguards. Bicamerals all gone. Lianna dead. Oh God, Lianna. You poor kid, you poor beautiful innocent corpse. You didn't deserve this; your only crime was faith...

One of the axial hatches passed around him. In the next instant he was swinging around an unaccustomed right angle: the Crown's spokes, rigged for thrust, still laid back along her spine. Rungs scrolled past his face as Moore pushed him headfirst to stern.

All our children, gone. Smarter, stronger, leaner. All those souped-up synapses, all those Pleistocene legacy issues stripped away. Where did it get them? Where are they now? Dead. Gone. Turned to plasma.

Where we'll be, probably, before long...

Maintenance & Repair. Moore folded out the medbed and strapped him in just as the Crown began clearing her throat. By the time he turned to leave, weight was seeping back into the world. Brüks tried to turn his head, and almost succeeded. He tried to clear his throat, and did.

"Uh...Jim..." It was barely above a whisper. The Colonel

paused at the ladder, a vague silhouette in the corner of Brüks's eye. The ongoing burn seemed to sink him into the deck.

"...Th-thanks," Brüks managed.

The silhouette stood silently in the burgeoning gravity.

"That wasn't me," he said finally, and climbed away.

Moore was not the only one to visit. Lianna returned to him from the grave, a dark flickering plasma who smiled down on his frozen features and shook her head and whispered *You poor man, so lost, so arrogant* before the sun called her back home. Chinedum Ofoegbu stood for hours at his side and spoke with fingers and eyes and sounds that stuttered from the back of his throat, and somehow Brüks understood him at last: not the ululating cipher, not the intelligent hive cancer, but a kind old man whose fondest childhood memory was the family of raccoons he'd surreptitiously befriended with a few handfuls of kibble and subtle sabotage inflicted on the latch of the household organics bin. *Wait—you had a childhood?* Brüks tried to ask, but Ofoegbu's face and hands had disappeared under eruptions of buboes and great ropy tumors, and he could no longer get out the words.

Rhona even came back from Heaven, though she'd sworn she never would. She stood with her back to him, and fumed; he tried to turn her around and make her smile, but when she did the expression was bitter and furious and her eyes were full of sparks. *Oh, do you miss her?* she raged. *You miss your mindless puppet, your sweet adoring ego-slave? Or is it just the fact that you've lost the one small fake part of your whole small fake life where you had some kind of control? Well, the chains are off, Dan, they're off for good. You can rot out here for all I care.*

But that's not what I meant, he tried, and *I never thought of you that way,* and—when he finally ran out of denials and had nothing else to say: *Please. I need you. I can't do it on my own...*

Of course you can't, she sneered. *You can't do anything on your own, can you? I'll give you that much: you've actually turned incompetence into a survival strategy. Whatever would you do if*

you actually lost your excuses, if you augged up like everyone else? How would you ever survive without your disability to invoke when you can't keep up?

He wondered what Heaven could possibly be like, to make her so vindictive. He would have asked but Rhona had turned into Rakshi Sengupta right in front of his fossiled eyes, and her train of thought seemed to have jumped to a whole different track. *You gotta stay away from the bow*, she whispered urgently, glancing nervously over her shoulder. *You gotta stay out of the attic, he's in there now and maybe something else. I wish you'd come back this could be bad and I'm only good with numbers, you know? I'm not so hot in meatspace.*

You're doing fine, Brüks tried to say. *You're even starting to talk like one of us roaches*. But all he could manage was a croak and a cough and whatever Rakshi heard seemed to scare her more than his silence had.

Sometimes he opened his eyes to see Moore looming over him, moving shiny blinking chopsticks in front of his face. Once or twice an invisible roaring giant stood on his chest, pressing him deep into the soft earth at his back (the sparse bands of new-grown grass on the bulkhead bowed low against the wall, every blade in uniform alignment); other times he was as weightless as a dandelion seed. Sometimes he could almost move, and the creatures gathered at his side would startle and pull back. Other times he could barely roll his eyes in their sockets.

Sometimes he woke up.

Something sat at his side, a vaguely humanoid blur at the edge of eyesight. Brüks tried to turn his head, unfix his gaze from the ceiling. All he could see was pipes and paint.

"It's only me." Moore's voice.

Is it. Is it really.

"I guess you weren't expecting it," said the blur. "I'm actually surprised that Sengupta didn't tell you. It's the kind of thing she'd enjoy spreading around."

He tried again. Failed again. His cervical vertebrae seemed—fused, somehow. Corroded together.

“Maybe she doesn’t know.”

Brüks swallowed. That much he could do, although his throat remained dry.

The blur shifted and rustled. “It’s a mandatory procedure where I come from. Too many scenarios when conscious involvement—compromises performance. Whatever the military is these days, you don’t get into it unless you...”

A cough. A reset.

“The truth is, I volunteered. Back when everything was still in beta, before it was policy.”

Do you get to decide, Brüks wondered, when it comes and goes? Is it a choice, or is it a reflex?

“You may have heard we just go to sleep. Lose all awareness, let the body run on autopilot. So we won’t feel bad about pulling the trigger, afterward.” Brüks heard a note of bitterness in the old man’s voice. “It’s true enough, these days. But we first-gen types, we—stayed awake. They said it was the best they could do at the time. They could cut us out of the motor loop but they couldn’t shut down the hypothalamic circuitry without compromising autonomic performance. There were rumors floating around that they could do that just fine, that they *wanted* us awake—for debriefing afterward, experienced observer in the field and all—but we were such hot shit we didn’t really care. The sexy bleeding edge, you know. First explorers on the post-Human frontier.” Moore snorted softly. “Anyway. After a few missions that didn’t quite go according to plan, they rolled out the Nirvana Iteration. Even offered me an upgrade, but it—I don’t know. Somehow it just seemed important to keep the lights on.”

Why are you telling me this? What does it matter, now that you’ve thrown the world’s lifeline into the sun?

“What I’m saying is, I was there. The whole time. Only as a passenger—I wasn’t running anything—but I didn’t go away. I’m not like Valerie’s mercenaries, I was—watching, at least. If that makes you feel any better. Just wanted you to know that.”

It wasn't you. That's what you're saying. It's not your fault.

"Get some rest." The blur stretched at his side; the Colonel's face resolved briefly in Brüks's field of focus, faded again to the sound of receding footsteps.

Which paused.

"Don't worry," Moore said. "You won't be seeing it again."

The next time he woke up Sengupta was leaning over him.

"How long?" Brüks tried, and was relieved to hear the words come out.

She said: "Can you move yet try to move."

He sent commands down his legs, felt his toes respond. Tried wiggling his fingers: his knuckles were rusted solid.

"Not eashily," he said.

"It'll come back it's just temporary."

"Wha' she *do* to me?"

"I'm working on that listen—"

"It's like some kind of ass-fac—*ass-backwards* Crucifix Glitch." His tongue fought its way around the words. "How the hell did she—baysh—*baselines* don't glitch, we don't have the shircuits —"

"I said I'm *working* on it. Look we got other things to worry about right now."

You've got *other things*, maybe—"Whersh Jim?"

"That's what I'm trying to *tell* you he's up there in the attic he's up there with *Portia* I think—"

"*Whah!*"

"Well how do we know *how* far that shit spread huh it coulda coated the whole inside of the array and we never woulda known. Coulda grown all the way up to our front door and got *inside*."

His sympathetic motor nerves were still working at least: Brüks could feel the hairs rising along his forearms.

"Anybody take sh—take *samples*?"

"That's not what I *do* I'm a math maid not a bucket boy I don't even know the protocols."

“You couldn’t look them up?”

“It’s not what I do.”

Brüks sighed. “What about Jim?”

Sengupta stared past him. “No help he just keeps reading those letters from home over and over. I told him but I don’t think he even cares.” She shook her head (she did it so *effortlessly*), added: “He comes down here sometimes checks up on you. He’s been shooting you up with all sorts of GABA and spasmolytics he says you should be good to go by now.”

He flexed his fingers; not too bad, this time. “It’s coming back, I guess. Body’s just out of practice.”

“Yah it’s been a while. Anyway I gotta get back.” She stepped across the hab, turned back at the base of the ladder. “You gotta get back in the game Dan things are getting weird.”

They were, too.

She’d never called him by name before.

He’d stopped slurring his words by the time Sengupta had departed; five minutes later he could roll from side to side without too much discomfort. He bent knees and arms in small hard-won increments, ratcheting each joint against the brittle resistance of his own flesh. At some critical angle his right elbow *cracked* and pain splintered down his arm like an electrical shock: but the limb worked afterward, bent and straightened at his command with nothing but a dull arthritic aching in the joint. Encouraged, he forced his other limbs past their breaking points and reclaimed them for his own.

Reclaimed from what? he wondered.

The medical archives reenacted the corruption of his flesh in fast-forward: a body flooded with acetylcholine, Renshaw cells compromised, ATP drawn down to the fumes by fibrils that just wouldn’t stop clenching. No ATP to cut in and ask myosin for this dance; nothing to break the actin-myosin bond. Gridlock. Tetany. A charley horse that froze the whole damn body.

The mechanism was simple enough: once the action potentials started hammering *that* fast it could only end one

way. But this didn't seem to be drug induced. Valerie hadn't spiked his coffee or slipped anything into his food. His medical telemetry hadn't picked up the trail until long minutes after Brüks had been hit, but as far as he could tell those signals had come from his own brain: CNS to alpha-motor to synaptic cleft, boom boom boom.

Whatever this was, he'd inflicted it on himself.

He took his time in checking out. Time to extract the catheters and stretch his limbs; time to boot his defossilized corpus back into some semblance of an active state. Time to refuel: his convalescence had left him ravenous. Almost an hour had passed by the time he climbed out of M&R in search of whatever the galley might serve up.

He was halfway across the Hub before he noticed the light bleeding from the spoke.

A snapshot of the past: a corpse, laid out on the lawn. Brüks didn't know which element was the more incongruous.

The lawn, he supposed. At least that was unexpected: not so much a lawn as a patchy threadbare rug of blue-green grass—rusty in the dim longwave vampires preferred—ripped from the walls of the hab and strewn haphazardly across the deck. Vampires had OCD, Brüks remembered vaguely. The mythical ones at least, not the ancient flesh-and-blood predators that had inspired them. Seventeenth-century folk legends had it that you could drive a vampire to distraction by the simple act of throwing salt in its path; some supernatural brain circuit would compel it to drop everything and count the grains. Brüks thought he'd read that somewhere. Probably not peer reviewed.

For all he knew, that ridiculous superstition might have at least a rootlet in neurological reality. It certainly wasn't any more absurd than the Crucifix Glitch; maybe some pattern-matching hiccup in those omnisavant brains, some feedback loop gone over the top. Maybe Valerie had fallen victim to the same subroutine, seen all those thousands of epiphytic blades and torn them from their bulkhead beds with her bare

fingerprints, counting each leaf as it fluttered to the deck in a halfhearted chlorophyllous blizzard.

Of course, the catch was that vampires didn't have to *count*: they would simply see the precise number of salt grains or grass leaves in an instant, know that grand seven-digit total without ever going through the conscious process of adding it up. Any village peasant who sacrificed two seconds scattering salt in his path would buy himself a tenth-of-a-second's grace, tops. Not a great rate of exchange.

Maybe the zombie hadn't known that, though. Maybe the homunculus behind the eyes had rebooted just in time to see what was coming, maybe it somehow wrested control back from all those shortcuts and back alleys and tried one last-ditch Hail Mary with nothing left to lose. Maybe Valerie had let it, watching, amused; maybe even played along, pretended to count each falling blade while her dinner turned the deck into a haphazard shag rug.

Maybe the zombie hadn't even cared. Maybe it had just lain down on command and waited to be eaten. Maybe Valerie had just wanted a tablecloth.

The zombie's throat had been slashed. It lay spread-eagled on its stomach, naked, face turned to the side. The right buttock had been carved away; the quads; one long strip of calf muscle. There was flesh above and flesh below: in between, a flensed femur connected the lower leg to the torso, socketed into the broad scraped spatula of the pelvic girdle.

There was very little blood. Everything had been cauterized.

"You never checked it out," Brüks said.

Sengupta zoomed the view: the gory table setting expanded across the window. Blades of grass grew to the size of bamboo shoots; tooth marks resolved like jagged furrows on bared bloody bone.

Some kind of wire snaked through the grass—barely visible even at this magnification—and disappeared beneath the half-eaten corpse.

"Found eight wires don't know what for exactly but that thing wasn't exactly Secret Santa you know? Carnage said

probably booby traps and Carnage is probably right for once. She wanted us to see this.”

“How do you know?”

“This is the only feed she didn’t break.” Sengupta waved the recording off the bulkhead.

“So you jettisoned the habs.”

She nodded. “Too risky to go in too risky to leave ’em there.”

Another feed abutted the first, a view down the truncated spoke that had once led to Valerie’s lair. It ended after only twenty meters now, in a pulsing orange disk flashing UNPRESSURIZED back up the tunnel at two-second intervals. Just like the Commons spoke opposite, cut loose in turn to keep the vectors balanced.

He remembered downhill conversations, the sound of glasses clinking together. “Shit,” he said.

“It’s not like they’re not all the same you know they all got the same plumbing and life support.”

“I know.”

“And it’s not like we’re gonna run out of food or air what with everybody being dead and—”

“I fucking *know*,” Brüks snapped, and was surprised when Sengupta fell immediately silent.

He sighed. “It’s just, the only half-decent moments I’ve had on this whole bloody trip were in Commons, you know?”

She didn’t speak for a moment; and when she did, Brüks couldn’t make out the words.

“What did you say?”

“You talked to him down there,” she mumbled. “I *know* that but it doesn’t matter even if it was still here *he’s* not. He just sits up in the attic and runs those signals over and over like he never even left Icarus...”

“He lost his son,” Brüks said. “It changed him. Of course it changed him.”

“Oh yah.” She barely spoke above a whisper. Something in that voice made Brüks long for the trademark hyena laugh. “It changed him all right.”

No excuses left. Nothing else to do.

He ascended into the Hub, breached its sky into the guts beyond: hissing bronchioles, cross-hatched vertebrae, straight-edged intestines. He moved like an old man, free fall and residual paralysis and the spacesuit he'd scavenged from the cargo-bay airlock all conspiring to take him to new depths of clumsiness. Up ahead, the paint around the docking hatch splashed the surrounding topography with the usual diffuse glow.

This is where the shadows come, Brüks realized. Every other corner of the Crown is bright as a swimming pool now that the Hold's off-limits, now that Valerie's cave has been cut loose. Shadows don't have a chance back there.

They've got nowhere else to go...

"Welcome back to the land of the living."

Jim Moore turned slowly in the rafters, just past the airlock. The lines of his face, the edges of limbs moved in and out of eclipse.

"This is living?" Brüks tried.

"This is the waiting list."

He thought he might have seen a smile. Brüks pushed himself across the attic and pulled a welding torch from the tool rack: checked the charge, hefted the mass. Jim Moore watched from a distance, his face full of shadow.

"Uh, Jim. About—"

"Enemy territory," Moore said. "Couldn't be helped."

"Yeah." A fifth of the world's energy supply, in the hands of an intelligent slime mold from outer space. Not a cost-benefit decision Brüks envied. "The collateral, though..."

Moore looked away. "They'll make do."

Maybe he was right. Firefall had slowed Earth's headlong rush to offworld antimatter; a power cord stretched across a hundred fifty million kilometers was far too vulnerable for a universe in which godlike extraterrestrials appeared and vanished at will. There were backups in place, fusion and forced photosynthesis, geothermal spikes driven deep into the earth's crust to tap the leftover heat of creation. Belts would be

tightened, lives might be lost, but the world would make do. It always had: the beggars and the choosers and the spoiled insatiable generations with their toys and their power-hungry virtual worlds. They would not run out of air, at least. *They* would not freeze to death in the endless arid wastes between the stars.

For Moore so loved the world that he gave his only begotten son. Twice.

"Anyway," Moore added, "we'll know soon enough."

Brüks chewed his lip. "How long, exactly?"

"Could be home in a couple of weeks," Moore said indifferently. "You'd have to ask Sengupta."

"A couple—but the trip down took—"

"Using an I-CAN running on half a tank, and keeping our burns to an absolute minimum. We're on purebred beamed-core antimatter now. We could make it to Earth in a few *days* if we opened the throttle. We'd just be going too fast to stop when we got there. End up braking halfway to Centauri."

Or somewhere in between, Brüks thought.

He looked across the compartment. Moore pinwheeled slowly through light and shadow and looked back. This time the smile was as unmistakable as it was cryptic.

"Don't worry about it," he said.

"About...?"

"We're not headed for the Oort. I'm not taking you away on some misguided desperate search for my dead son."

"I—Jim, I didn't—"

"There's no need. My son is alive."

Maybe six months ago. Maybe even now. I suppose it's possible. Not in six months, though. Not after the telematter stream winks out and leaves Theseus to freeze in the dark.

Not after you cut him adrift..

"Jim..."

"My son is alive," Moore said again. "And he's coming home."

Brüks didn't say anything for a while. Finally: "How do you know?"

“I know.”

Brüks pushed the torch with one hand into the other, felt the solid reality of mass and inertia without: the fragility of aching body parts within. “Okay. I, um, I should take some samples—”

“Of course. Sengupta and her invading slime mold.”

“Doesn’t cost anything to check it out.”

“ ‘Course not.” Moore reached out a casual hand, anchored himself to an off-duty ladder. “I take it the suit’s a condom.”

“No point in taking chances.” Watching Moore in his yellow paper jumpsuit, the Colonel’s naked hand clenched on untested territory.

“No helmet,” Moore observed.

“No point in going overboard, either.” If *Portia* ran on ambient thermal, it wouldn’t be getting enough joules from the bulkhead to sprout any pseudopods on short notice. Besides, Brüks felt stupid enough as it was.

Under Moore’s bemused gaze he positioned himself to one side of the hatch and dialed the beam down to short focus. Smart paint sparked and blistered along the lip of the hatch. Nothing screamed or recoiled. No tentacles extruded from the metal in frantic acts of self-defense. Brüks scraped a sample from the scored periphery of the burn. Another from the untouched surface a few centimeters farther out. He moved systematically around the edge of the hatch, taking a sample every forty centimeters or so.

“Will you be using that on me?” Moore wondered behind him.

I should. “I don’t think that’s necessary just yet.”

Moore nodded, his face impassive. “Well. Change your mind, you know where I am.”

Brüks smiled.

I wish I did, my friend. I really wish I did.

But I don’t have a fucking clue.

Out of the attic into the Hub.

Looks like the Hub, anyway. Could be a lining. Could be a skin.

Through the equator, from frozen north to pirouetting south.
Try not to touch the grate on your way through.

Could be watching me right now. I could be swimming through an eyeball.

Don't be an idiot, Brüks. Portia had years in Icarus; you were there for three weeks. Not nearly enough time to grow enough new skin to—

Unless it didn't grow new lining, unless it just redistributed the old. Unless it spent all those years building up extra postbiomass as an investment against future expansion.

It couldn't just ooze through the front door and down the throat without anyone noticing. (Coasting between an eyeball and an iris now: one open, one shut, both silver. Both blind.) No kinetic waste heat, no mass alarms—

Unless it moved slowly enough to blend in with the noise. Unless it happens to know a little more about the laws of thermodynamics than we do...

Down the spoke, putting on weight, staring hard at the gloved fingers clenched around their handhold. Alert for subtle mycelia threading between suit and stirrup. Eyes open for any bead of moisture there, some meniscus of surface tension that might belie a film in motion.

You're being paranoid. You're being an idiot. This is just a precaution against a remote possibility. That's all this is.

Don't go off the deep end. You're Dan Brüks.

You're not Rakshi Sengupta.

You only made her.

He heard her moving in the basement as he fed samples into the holding tray. He tried to ignore her foot taps and mutterings as the scrapings cycled through quarantine, as he gave in to reawakened hunger and wolfed down whatever the lab hab's bare-bones galley disgorged, swallowing not quite fast enough to stay ahead of the *Spirulina* aftertaste.

Finally, though, he gave in: pushed from above by Moore's matter-of-fact dissonance, pulled from below by Sengupta's

compulsive scuttling. He climbed down out of the lab, maneuvered around the giant seedpod obstruction of Sengupta's tent beside his own. The pilot was running ConSensus on the naked bulkhead between two impoverished bands of astroturf. The *Crown of Thorns* rotated there in animatic real time, two of her limbs amputated at the elbow. *We keep going at this rate and we're going to be three spacesuits and a tank of O₂ by the time we get home*, Brüks mused.

A dot on the map: MOORE, J. floated safely distant in the attic. Other readouts formed a sparse mosaic across the bulkhead; Brüks couldn't understand them all but he was pretty sure that one or two involved the blocking of intercom feeds.

She turned as his feet hit the deck, stared expectantly at his lapel.

"Jim," he said.

"Yah."

"You said he'd—changed..."

"Don't have to take my word for it you saw it yourself he's been changing ever since we left LEO."

Brüks shook his head. "He was only—distracted before. Preoccupied. Never delusional."

Sengupta ran her fingers down the wall; file listings flew by too fast for Brüks to make out. "He was transmitting into the Oort did you know that? Even before we left Earth he broke the law hell he helped *make* that law after Firefall nobody else could get away with it but man, he's the great Jim Moore and he was—sending messages..."

"What kind of messages?"

"To *Theseus*."

"Well, of course. He was with Mission Control."

"And it talked *back*."

"Rakshi. So *what*?"

"It's talking to him *now*," Sengupta said.

"Uh—what? Through all the interference?"

"We're out of the solar static already most of it anyhow. But he's been collecting those signals for way longer some of the timestamps go back seven years and they *change*. All the early

stuff that's all just telemetry you know? Lot of voice logs too but mainly just data, all the sensor records contingency analyses and about a million different scenarios that vampire that *Sarasti* was running when they were closing on target. It was dense there was noise all *over* the signal but the streams were redundant so you can make it out if you run it through the right filters right? And then *Theseus* goes dark you don't hear anything for a while and then there's this—"

She fell silent.

"There's what, Rak?" Brüks prompted gently.

She took a breath. "There's this *other* signal. Not tightbeam. *Omnidirectional*. Washing over the whole innersys."

"He said *Theseus* went dark," Brüks remembered. "They went in and lost contact and that was all anybody knew."

"Oh he knew. It's really thin and it's so degraded you can barely make it out even *with* every filter and noise-correction algorithm in the arsenal I don't think you'd even see it if you didn't already know it was there but Colonel Carnage, man he *knew*. He picked it out and it's...it's..."

Her fingers danced and jittered in the air between them. The faintest breeze of static wafted through the hab: the moan of a distant ghost.

"That it?" Brüks asked.

"Almost but then you add the last couple of Fouriers and—"

—And a *voice*: thin, faint, sexless. There was no timbre to it, no cadence, no sense of any feeling behind the words. Any humanity it ever might have contained had been eroded away by dust and distance and the dull microwave rumble of a whole universe roaring in the background. There was nothing left but the words themselves, not reclaimed from static so much as built from the stuff. A whisper on the void:

Imagine you are Siri Keeton. You wake in an agony of resurrection...record-shattering bout of sleep apnea spanning one hundred forty...feel your blood, syrupy...forcing its way through arteries shriveled by months on standby. The body inflates in painful increments: blood vessels dil...flesh peels apart from flesh; ribs crack...udden unaccustomed flexion. Your joints have seized up

through disuse. You're a stick man, frozen...rigor vitae. You'd scream if you had the breath.

The hab fell silent.

"What the fuck was that?" Brüks whispered after a very long time.

"I dunno," Sengupta drummed her fingers on her thigh. "The start of a story. It's been coming through in bits and pieces, every few years according to the timestamps. I don't think it's finished, either, I think it's still—in progress."

"But what *is*—"

"*I don't know okay?* It says it's Siri Keeton. And there's something *underneath* it too not words exactly I don't know."

"Can't be."

"Doesn't matter what you or I think *he* thinks it's Siri Keeton. And you know what he's talking back to it I think he's talking back."

My son is alive.

"He's got a while to wait. If that's really coming from the Oort it'll be a solid year before he can even think about getting an answer."

Sengupta shrugged and looked at the wall.

He's coming home.

ANY SUFFICIENTLY ADVANCED TECHNOLOGY IS INDISTINGUISHABLE FROM NATURE.

—KARL SCHROEDER

NEGATIVE.

Negative.

Negative.

Torn lattices and broken nanowires and mangled microdiodes. Eviscerated smart paint. Nothing else.

For hours now he'd let worst-case scenarios play out in his

imagination. *Portia* had expanded into the *Crown*. *Portia* had spread past the attic. *Portia* had oozed invisibly across every bulkhead and every surface, coated the skins of tents and of crewmembers, wrapped itself around every particle of food each of them had taken into their mouths from the moment they'd docked. *Portia* enveloped him like a second skin; *Portia* was *inside* him, measuring and analyzing and corroding him from the outside in and the inside out. *Portia* was everywhere. *Portia* was everything.

Bullshit.

His neocortex knew as much, even as his brain stem stole its insights and twisted them to its most paranoid ends. Whatever *Portia's* ultimate origin, it was the telematter system that had built it: lasers etching blank condensates into thinking microfilms that planned and plotted and spread across each new frontier like a plague of cognition. However far it had spread, however much or little had infiltrated the *Crown*, it couldn't keep growing once severed from the engine of its creation. They hadn't been docked *that* long: surely the enemy couldn't have achieved anything but the most superficial penetration of the front line.

The samples were clean.

Which proved, of course, absolutely nothing.

Aboard *Icarus* it had sprung shut like a leg-hold trap—but it had had unlimited power to play with, and eight years to learn how to use it. One passive filter on the solar panels, damped by a thousandth of a percent. One short-circuited electrical line, sparking and heating the surrounding metal. That's all it would have taken—just time, and a little Brownian energy to keep it fed.

What had Sengupta said so offhandedly, just before *Portia* had attacked? *Little warm in there...*

It can't sprint without stockpiling energy, he mused. Maybe it builds up a detectable heatprint before it pounces...

Sengupta poked her head up through the floor. "Find anything?"

Brüks shook his head as she climbed onto the deck.

“Yah well *I* did. I found how that fucking vampire turned you to stone and better you than me, sorry but it *coulda* been me or Carnage either for all I know. I think she did it to all of us.”

“Did *what*, exactly?”

“You ever been *scared* roach?”

All the time. “Rakshi, we almost *died*—”

“*Before* that.” Sengupta head jerked back, forth. “Scared for *no reason* scared just going to the *bathroom*.”

Something jumped in his stomach. “What did you find?”

She threw a camera feed onto the wall: an eye in the attic, looking down along the empty compartment to the Hub hatch. Sengupta zoomed obliquely on a patch of bulkhead beside the secondary airlock. Someone had scrawled some kind of glyph across that surface, a tangle of multicolored curves and corners that might have passed for some Cubist’s rendition of a very simple neural circuit.

“I don’t remember seeing that before,” Brüks murmured.

“Yah you do you just don’t *remember* it. Only lasts two hundred milliseconds pure luck this showed up on a screen grab. You see it but you don’t remember it and it scares the shit out of you.”

“Not scaring me now.”

“This is just one *frame* roach it’s part of an *animation* but the cameras don’t scan fast enough and they’re all gone now. I had to sieve like a bugger to even get this much.”

He stared at the image: a jagged little tangle of lines and arabesques, a piece of abstract graffiti maybe a hand’s-width across. It almost looked meaningful when spied from the corner of the eye, like a collection of letters on the verge of forming a word; it dissolved into gibberish when you looked at it. Even cut out of sequence, even spied from this oblique angle, it made his brain itch.

“It’s like she painted—gang signs,” he said softly. “All over the ship.”

“That’s not all she did the way she *moved* remember I *said* I didn’t like the way she moved all those little clicks and ticks—shit even that time she attacked me and then *you* I saw her

whisper things in your ear what did she say to you huh?”

“I—don’t know,” Brüks realized. “I don’t remember.”

“Yah you do. Just like that time in Budapest, changed your wiring with vibrations like lining up a bunch of beer glasses pretty wild right?” Sengupta tapped her temple three times in rapid succession, hard. “Not even radical I mean you can’t hear a word or smell a fart without your brain rewiring at least a bit that’s how brains *are* everything reprograms you. She just figured out where to stamp on the floor to make you freeze up on command. Coulda happened to me just as easy.”

“It *did* happen to you,” Brüks said. “Why did you attack her, Rak? I saw you in the Hub, you went at her like a rabid dog. What got into you?”

“I dunno it was like she was making these *noises* they just *really* pissed me off I dunno couldn’t help myself.”

“Misophonia.” Brüks barked a soft bitter laugh. “She gave you misophonia.”

Images from Simon Fraser: Valerie strapped to a chair, tapping on the armrest...*Even back then she was doing it. Even when they were torturing her, she was—reprogramming them...*

He couldn’t help laughing.

“What?” Sengupta said. “*What?*”

“You know the secret of a good memory?” He bit back another laugh. “You know what really kicks the hippocampus into overdrive, burns tracks into your brain faster and deeper than anything this side of direct neuroinduction?”

“Roach you gotta—”

“Fear.” Brüks shook his head. “All that time, playing the monster. I thought she was just into sadistic games, you know? I thought she just got off on scaring us. But she was never that—gratuitous. She was only cranking up the baud rate...”

Sengupta smacked her lips and looked out the window.

He snorted softly. “Even that time in the attic, Lee and I—we couldn’t even look. We just *knew* she was up there, but we were *facing each other*, Rak. We were each terrified by something to our *left* but we were *facing each other*—” *Of course we were, it’s obvious. Why didn’t I see it before?* “I bet she wasn’t there at all,

it was just—temporoparietal hallucinations. Night hags. Sensed-presence bullshit.”

“Roach remembers.” Sengupta was almost whispering. “Roach is starting to *wake up*...”

“She was moving us around like checkers.” Brüks didn’t know whether to be awed or terrified. “The whole time...”

“And what *else* did she program into us huh? We gonna start seeing things that aren’t there or go walking naked on the hull?”

Brüks thought about it. “I don’t—think so. Not if she hacked us all the same way, anyway. Basic things, sure. Fear. Lust. Stuff that’s universal.” He smiled, a bit grimly, at the thought of the *Crown’s* surviving denizens sprouting preprogrammed hard-ons and spiked nipples. *And that is really not a picture I need in my head right now.* “You want to hack higher-level behavior, you’re getting into formative childhood experiences, specific memory pathways. Too many individual differences for one-size-fits-all.”

Sengupta clicked her teeth. “That’s *old* roach talking new roach should know better. Who *knows* what that—”

“She couldn’t hack the Bicomeral,,” he said slowly.

“What?”

“These tricks—they exploit classic pathways, they’d never work on someone who’d remixed their brain circuitry. She had to get them out of the way.” A thousand pieces fell suddenly, blindingly into place. “That’s why she attacked the monastery, that’s why she didn’t just knock on the front door with an offer. She wanted to goad them into getting *noticed*. She knew how the roaches would respond, right down to a weaponized biological just lethal enough to keep the hive out of the way for the trip but not lethal enough to derail the mission completely. *Fuck.*” He sucked in his breath at the thought.

“You see the problem,” Sengupta said.

I don’t see anything but problems. “Which one in particular?”

“She’s a *vampire* she’s prepost-Human all wrapped up into one. These fuckers solve NP-complete problems in their *heads* and they drop us like go stones and she’s stupid enough to *just*

accidentally get locked outside when we leave?”

Brüks shook his head. “She burned. I saw her. Ask Jim.”

“*You ask him.*” She turned, her eyes lifting from the deck the moment his face fell from view. “Go on. He’s right up there.”

“No hurry,” Brüks said after a moment. “I’ll see him when he comes down.”

To stern the transplanted parasol held back the sun: a great black shield, coruscations of flame still flickering intermittently past its edges. Ahead, the stars: one at least crawled with life and chaos, too distant yet to draw the eye, more hypothesis than hope but closing, closing. That was something.

In between:

A metal spine webbed in scaffolding, lumpy with metal tumors. Spokes and habs and cauterized stumps sweeping one way across the sky; a weighted baton sweeping the other to balance the vectors. The Hub. The Hold: a cylindrical cavern abutting the shield to stern, its back end ragged and gaping into space. Once it had been full of cargo and components and thinking cancers: now it was packed with tonnes of uranium and precious micrograms of antihydrogen and great toroidal superconductors big as houses.

And shadows everywhere: webs and jigsaws cast by a hundred dim lanterns decorating the tips of antennae or the latches of access panels or mounted as porch lights around the edges of half-forgotten emergency airlocks. Sengupta had turned them all on and maxed them all out but they were waypoints, not searchlights: they didn’t so much illuminate the darkness as throw it into contrast.

No matter. Her drone didn’t need light to see.

She’d eschewed the usual maintenance ’bots that crawled spiderlike along the hull, patching and probing and healing the scars left by micrometeorites. Too obvious, she’d said. Too easy to hack. Instead she’d built one from scratch, remote-printed it on the fabricator still humming away in the refitted Hold: decompiled one of the standard bots for essential bits of

lanthanum and thulium and built the rest from the *Crown's* matter stockpile like Yahweh breathing life into clay. Now it made its painstaking way over a landscape of struts and conduits, shadows and darkness overlaid with false-color maps on a dozen wavelengths.

"*There!*" Sengupta cried for the fourth time in as many hours, and then "*Fuck.*"

Just another pocket of outgassing. By now Brüks had learned not to worry about the myriad leaks in the hull. The *Crown of Thorns* was a sieve. Most ships were. Fortunately the holes in that mesh were pretty small: it would take years for the internal air pressure to decline significantly, barring a direct hit from anything larger than a lentil. They'd die of starvation or radiation sickness long before they had to worry about asphyxiation.

"Felching hell *another* leak I swear..." Sengupta's voice trailed off, rebooted: "Wait a second..."

The telltales looked the same to Brüks: the faintest wisp of yellow on infrared, the kind of heat a few million molecules might retain for a moment or two after bleeding out from some warmer core. "Looks like more microgassing to me. Smaller than that last one, even."

"Yeah but look where it *is.*"

Along one of the batwing struts where the droplet radiator sprouted from the spine. "So?"

"No atmo there no tanks or lines either."

One long arm swept through the near distance, like the candle-lit vane of a skeletal windmill. Another.

Sengupta played with herself. Her marionette picked a careful route through dark, jumbled topography. Something hunkered on the hull ahead, its visible outlines buried in shadow. Infrared showed nothing but that diaphanous micronebula dissipating across the hull.

Can't cloak thermal emissions, Brüks remembered. *Not if you're an endotherm.* "That's not enough of a heat trace—"

"Not if you're a cockroach. Plenty big enough if you can *shut yourself off for a few decades...*"

“Just LIDAR it.”

Sengupta jerked her head back and forth. “No chance nothing active there could be tripwires.”

It can't be her, Brüks told himself. *I saw her burn...* “What about StarlAmp?” he wondered.

“I'm *using* StarlAmp we just gotta get closer.”

“But if she's tripwired against active sensors—”

“Proximity alert I know”—Sengupta nodded and tapped and kept her eyes on the prize—“but that would be active too and I could pick it up. Plus I'm hiding a lot.”

She was: the 'bot's eye saw struts and plating more often than shadows within shadows. Sengupta was keeping her head down on approach. At the moment they could see nothing but the looming face of some small grated butte dead ahead.

“Right around the corner now this should do it.”

The drone farted hydrogen and drifted gently out of eclipse. Still nothing but faint amorphous yellow on infrared.

On StarlAmp, though: a silver body, legs straight arms spread, wired against the side of the ship. Boosted photons rendered the body in fragments: ridges of mirrored fabric glinting in thousand-year-old starlight, creases that swallowed any hint of mass or structure. The spacesuit was a patchwork of bright strips and dark absences, the shell of some tattered mummy with half its bandages ripped away and nothing at all underneath. But the right shoulder shone pale and clear: the double-*E* crest boasting the unsurpassed quality of Extreme Environments, Inc., protective gear; a name tag, programmable for the easy identification of multiple users.

LUTTERODT.

It can't be, Brüks thought. *I saw her, she was dead, her faceplate was in pieces. She was not unconscious. She was not stunned. That was not her I saw pounding on the hatch, awake again, running for her life, too frantic to notice that she'd awakened in someone else's suit. It was not Lianna we left to burn, it was Valerie. It was Valerie. We abandoned no others who were not already dead.*

We did not do this.

Sengupta was making noises somewhere between laughter

and hysteria: “I *told* you I *told* you I *told* you.

“Not stupid at *all*. She knows what she’s doing.”

Out there all this time, Brüks thought. *Hiding. I would never have found her. I would never have even looked.*

Maybe Portia’s *hiding, too. Maybe I just haven’t looked hard enough.*

“We have to tell Jim,” he said.

“Will you look at that,” Moore remarked.

Lianna’s spacesuit flickered on the dome, a snapshot taken before Sengupta had pulled the drone back for fear of setting off alarms. Not that a live feed would have been any more dynamic.

“It’s Valerie it’s fucking *Valerie*—”

“Apparently.”

It can’t be, Brüks thought for the thousandth time, the voice in his head weaker with each iteration. By now it was barely whispering.

“I told you we can’t *trust*—”

“She seems harmless enough for now,” the Colonel remarked.

“*Harmless* are you felching crazy don’t you remember what she—”

Moore cut her off: “There’s no way that suit could support an active metabolism all the way back to Earth and there’s no sign of any kind of octopus rig. She’s gone undead for the trip home. Probably expects to revive and jump ship when we dock in LEO. Waking up earlier wouldn’t accomplish anything except using up her O₂.”

“*Good* then I say we give the bot some teeth and go scrape her off the hull like a goddamn barnacle while we got the chance.”

“By all means, if you think she hasn’t set up any defenses against just that scenario. If you’re certain the hull isn’t booby-trapped with a nanogram of antimatter set to blow a hole in the ship if anything disturbs her. I assumed you realized that she’s *smart*. You certainly pulled your drone back fast enough.”

That gave her pause. “Whadda we do then?”

“She’s waiting for us to dock. So we don’t dock.” Moore shrugged. “We jump ship and let the *Crown* burn up on reentry.”

“And then what surf back through the atmosphere on top of a passing comsat? If I was supposed to pack a shuttle nobody told me.”

“One thing at a time. For now, just continue your hull crawl in case she’s left anything else out there for us to find. If you’ll excuse me”—he drifted around his own axis and pushed himself off the deck—“I have my own work to do.”

He disappeared into the attic. Brüks and Sengupta stayed at the mirrorball. Buried in the shadows of some obscure province on the hull, Valerie lay still as death in her stolen skin.

“What does she *want*?” Brüks wondered.

“What all of them want I guess to touch the Face of God.”

The common enemy, he remembered. “That whole enemy-of-my-enemy thing went down the toilet the moment she slaughtered the Bicams. Whatever it was, she wanted sole access.”

“She’s got *plans* for God oh yah they all did. Too bad God had plans for them too.”

Maybe she wasn’t happy just touching the Face of God, he mused. *Maybe she wants to bring God home as a pet. Maybe, while we’ve been going crazy looking for Portia in here, it’s been out there all along sealed up in a ziplock bag.*

Another good reason to burn this fucking ship. As if we needed one.

“Whatever those plans were,” he said, “they’re all dead in the water now.”

“Oh you think so huh?”

“Jim’s—”

“Oh *Jim* that’s a good one. Because vampires are no match for roach plans are they? So how did she get *out* then in the first place huh? How come she isn’t still strapped to a chair solving puzzles at SFU?”

Every vampire ever brought back from the junkyard:

scrupulously isolated from their own kind, every aspect of their environment regulated and monitored. Hemmed in by crosses and right angles, mortally dependent on precisely rationed drugs to keep them from seizing at the sight of a windowpane. Creatures that, for all their terrifying strength and intelligence, couldn't even open their eyes on a city street without keeling over.

Valerie, walking blithely out of her cage one night and scaring the piss out of prey in a local bar for chrissakes and *then walking back in again*, just to show that she could.

"I don't know," Brüks admitted.

"I do." A single, jerky nod. "It wasn't just her there were others there were three other vampires in that lab and they worked *together*."

He shook his head. "They'd never have met. Vampires are hardly ever allowed in the same wing of a building at the same time, let alone the same room. And if they *did* meet they'd be more likely to tear out each other's throats than draw up escape plans."

"Oh they drew up their plans all right they all just did it *alone*."

Brüks felt a contradiction rising on his tongue. Then it sunk in.

"*Shit*," he said.

"Yah."

"You're saying they just *knew* what the others were going to do. They just—"

"*Elevated respiration from the short redhead prey consistent with conspecific encounter within the past two hundred breaths*," Sengupta chanted. "*East south corridors public so exclude them; conspecific must have been moved twenty meters along the north tunnel no more than one hundred twenty five breaths ago. Like that.*"

Each observing the most insignificant behavioral cues, the subtlest architectural details as their masters herded them from lab to cell to conference room. Each able to infer the presence and location of the others, to independently derive the optimal

specs for a rebellion launched by X individuals in Y different locations at Z time. And then they'd acted in perfect sync, knowing that others they'd never met would have worked out the same scenario.

"How do you *know*?" he whispered.

"It's the *only way* I tried to make it work from every other angle but it's the only model that *fits*. You roaches never stood a chance."

Jesus, Brüks thought.

"Pretty good hack right?" Admiration mingled with the fear in Sengupta's voice. "Can you imagine what those fuckers could do if they actually *could* stand to be in the same room together?"

He shook his head, amazed, trying to take it in. "That's why we made sure they couldn't."

"Made? I thought they were just you know. Really territorial."

"Nobody's *that* territorial. Someone must've amped their responses to keep them from ganging up on us." Brüks shrugged. "Like the Crucifix Glitch, only—deliberate."

"How do you know that I haven't seen that anywhere?"

"Like you said, Rak: it's the only the model that *fits*. How do you think the line could even breed if their default response was to eviscerate each other on sight? Call it the, the *Divide and Conquer* Glitch." He smiled bitterly. "Oh, we were good."

"They're better," Sengupta said. "Look I don't care how helpless Carnage thinks that thing is I'm not taking my fucking eyes off it. And I'm firewalling every onboard app and every subroutine I can find until I check every last one for logic bombs."

Now there's a *quick weekend project*. Aloud: "Anything else?"

"I don't *know* I'm working on it but how do I know she hasn't already figured everything I could think of? No matter what I do I could be playing right into her hands."

"Well, for starters," Brüks suggested, "what about welding the airlocks shut? You can't hack sheet metal."

Sengupta took her eyes off the horizon, turned her head. For

a moment Brüks even thought she might look at him.

“When it’s time to leave, we cut a hole,” he continued. “Or blow one. I assume this isn’t a rental. If it is, I’m pretty sure the damage deposit’s already a write-off.”

He waited for the inevitable put-down.

“That’s a *great* idea,” Sengupta said at last. “Brute-force baseline thinking shoulda thought of it myself. *Fuck* safety protocols. I’ll do the Hold and the spokes you do the attic.”

The docking hatch wouldn’t take a weld: it was too reactive, its reflexes almost the stuff of living systems. Clenched tight it could withstand the point-blank heat of lasers and still dilate on command like a dark-adjusting eye. Brüks had to make do with bulkhead panels from the attic, strip them from their frames and weld them into place across the airlock’s inner wall.

Jim Moore appeared at his side, wordlessly helped him maneuver the panels into place. “Thanks,” Brüks grunted.

Moore nodded. “Good idea. Although you could probably fab a better—”

“We’re keeping it low-tech. In case Valerie hacked the fabbers.”

“Ah.” The Colonel nodded. “Rakshi’s idea, I’m guessing.”

“Uh-huh.”

Moore held the panel steady at one end while Brüks set the focus. “Serious trust issues, that one. Doesn’t like me at all.”

“You can’t really blame her, given the way you folks—manipulated her.” Brüks lined up the keyhole, fired. Down at the tip of the welder, metal flared bright as a sun with an electrical *snap*; but the lensing field damped that searing light down to a candle flame. The tang of metal vapor stung Brüks’s sinuses.

“I don’t think she knows about that,” Moore said mildly. “And that wasn’t me in any case.”

“Someone like you, anyway.” Aim. Fire. *Snap*.

“Not necessarily.”

Brüks looked up from the weld. Jim Moore stared back

impassively.

“Jim, you told me how it works. *Herded into the service of agendas they’d never support in a thousand years*, remember? Somebody thought that up.”

“Maybe. Maybe not.” Moore’s eyes focused on some spot just past Brüks’s left shoulder.

You’re barely even here, Brüks thought. *Even now, half of you is caught up in some kind of—séance...*

“There’s a whole other network out there,” Moore was saying. “Orthogonal to all the clouds, interacting with them like—I don’t know, the way dark matter interacts with baryonic matter maybe. Weak effects, and subtle. Very tough to trace, but omnipresent. Ideally suited for the kind of tweaks we use to *marshal our forces*, as we like to say. And do you know what’s really remarkable about it, Daniel?”

“Tell me.”

“As far as we know, nobody built the damn thing. We just *discovered* it. Turned it to our own ends. The theorists say it could just be an emergent property of networked social systems. Like your wife’s supraconscious networks.”

“Uh-huh,” Brüks said after a moment.

“You don’t buy it.”

He shook his head. “A stealth supernet fine-tuned for the manipulation of pawns with a specific skill set suited to military applications. And it just *emerged*?”

Moore smiled faintly. “Of course. No complex finely tuned system could ever just *evolve*. Something must have *created* it.”

Ouch, Brüks thought.

“I’ll admit I’ve heard that argument before,” Moore said. “I just never thought I’d hear it from a biologist.”

Evidently half of him was enough.

AN INSTRUMENT HAS BEEN DEVELOPED IN ADVANCE OF
THE NEEDS OF ITS POSSESSOR

—ALFRED RUSSEL WALLACE

HE AWOKE TO the sound of jagged breathing. Shadows moved across the skin of his tent.

“Rak?”

The flap split down the middle. She crawled inside like some heartbroken infant returning to the womb. Even in here, cheek to jowl, she would not look at his face; she squirmed around and lay down with her back to him, curled up, fists clenched.

“Uh...,” Brüks began.

“I told you I didn’t like him I never did and now look,” Sengupta said softly. “We can’t trust him roach, I never really *liked* him but you could count on him at least you knew where he stood. Now he’s just—gone all the time. Don’t know *what* he is anymore.”

“He lost his son. He blames himself. People deal with it in different ways.”

“It’s more than that he lost his kid *years* ago.”

“But then he got him *back*. In a small way, for a little while. Can you imagine what that must be like—to, to deal with the loss of someone you loved only to find out that they’re still out there somewhere, and they’re *talking* and it doesn’t matter if they’re talking to you or not it’s still *them*, it’s *new*, you’re not just playing a sim or wallowing in the same old video she’s *actually out there* and—”

He caught himself, and wondered if she’d noticed.

I could have her back, he told himself. *Not in the flesh maybe, not here in the real world but real time at least, better than this thin graveside monologue Jim clings to. All I have to do is knock on Heaven’s door...*

Which was, of course, the one thing he’d sworn to never do.

“He says Siri’s alive,” Sengupta whispered. “Says he’s coming home.”

“Maybe he is. That clip from the transmission, right near the

beginning, you know? The coffin.”

She ran her finger across the inside of the tent. Words wrote themselves in her wake: *Point of view matters: I see that now, blind, talking to myself, trapped in a coffin falling past the edge of the solar system.*

Brüks nodded. “That’s the one. If you take that at face value, he’s not on board *Theseus* anymore.”

“Lifeboat,” Sengupta said. “Shuttle.”

“Sounds like he’s coasting in. It’ll take him forever, but there’ll be a hibernaculum on board.” He rested a hand on her shoulder. “Maybe Jim’s not wrong: maybe his son’s coming home.”

He lay there, breathing in the scent of oil and mold and plastic and sweat, watching his breath ruffle her hair.

“Something’s coming,” she said at last. “Maybe not Siri.”

“Why do you say that?”

“It just sounds *wrong* the way it talks there are these tics in the speech pattern it keeps saying *Imagine you’re this* and *Imagine you’re that* and it sounds so *recursive* sometimes it sounds like it’s trying to run some kind of *model*...”

Imagine you’re Siri Keeton, he remembered. And gleaned from a later excerpt of the same signal: *Imagine you’re a machine.*

“It’s a literary affectation. He’s trying to be poetic. Putting yourself in the character’s head, that kind of thing.”

“Why do you have to put yourself in your *own* head though eh why do you have to imagine what it’s like to be *you*?” She shook her head, a sharp little jerk of denial. “All those splines and filters and NCAs they take out so much you know, you can’t hear the words without them but you can’t hear the *voice* unless you strip them away. So I went back through all the steps I looked for some sweet spot where you might be able to hear and I don’t know if I did the signal’s so weak and there’s so much fucking noise but there’s this one little spot forty-seven minutes in where you can’t make out the words but you can sort of make out the voice, I can’t be sure you can never be sure but I think the harmonics are off.”

“Off how?”

“Siri Keeton’s male I don’t think this is male.”

“A woman’s voice?”

“Maybe a woman. If we’re lucky.”

“What are you saying, Rakshi? You’re saying it might not be human?”

“I don’t know I don’t *know* but it just *feels* wrong and what if it’s not a—a *literary affectation* what if it’s some kind of simulation? What if something out there is literally trying to imagine what it’s like to be Siri Keeton?”

“The voice of God,” Brüks murmured.

“I don’t know I really don’t. But whatever it is it’s got its hooks into a professional killer with a zombie switch in his brain. And I don’t know why but I know a hack a when I see one.”

“How could it know enough to hack him? How would it even know he exists?”

“It must’ve known Siri and Siri knew him. Maybe that’s enough.”

“I don’t know,” he admitted after a bit. “Hacking a human mind over a six-month time lag, it seems—”

“That’s enough touching,” she said.

“What?”

She shrugged his hand off her shoulder. “I know you gerries like to touch and have meat sex and everything but the rest of us don’t need *people* to get us off if you don’t mind. I’ll stay here but it doesn’t mean anything okay?”

“Uh, this is *my*—”

“What?” she said, facing away.

“Nothing.” He settled back down, maneuvered his back against the wall of the tent. It left maybe thirty centimeters between them. He might even be able to sleep, if neither of them rolled over.

If he felt the least bit tired.

Rakshi wasn’t sleeping, either, though. She was scratching at her own commandeered side of the tent, bringing up tiny light shows on the wall: a little animatic of the *Crown*, centered on the rafters where MOORE, J. clung to a ghost, or danced on the

strings of some unknowable alien agenda, or both; the metal landscape the drone traversed in search of countermeasures; the merest smudge of infrared where a sleeping monster hid in the shadows. There really weren't any safe places, Brüks reflected. Might as well feign what safety you could in numbers. The company of a friend, the warmth of a pet, it was all the same; all that mattered was the simple brain-stem comfort of a body next to yours, huddled against the night.

Sengupta turned her face a little: a cheekbone, the tip of a nose in partial eclipse. "Roach?"

"I really wish you'd stop calling me that."

"What you said before, about losing people. Different people deal in different ways that's what you said right?"

"That's what I said."

"How do *you* deal?"

"I—" He didn't quite know how to answer. "Maybe the person you lose comes back, someday. Maybe someday someone else fits into the same space."

Sengupta snorted softly, and there was an echo of the old derision there: "You just sit around and *wait*?"

"No, I—get on with my life. Do other things." Brüks shook his head, vaguely irritated. "I suppose *you*'d just whip up some customized ConSensus playmate—"

"*Don't you fucking tell me what I'd do.*"

Brüks bit his lip. "Sorry."

Stupid old man. You know where the hot buttons are and still you can't help pushing the damn things.

There was a bright side, though, to Colonel Carnage's deepening insanity, to Valerie's lethal waiting games, to ghosts haunting the ether and uncertain fates waiting to pounce: at least Rakshi wasn't hunting *him* anymore. He wondered at that thought, a little surprised at Sengupta's place atop his own personal hierarchy of fear. She was just a human being, after all. Unarmed flesh and blood. She wasn't some prehistoric nightmare or alien shapeshifter, no god or devil. She was just a kid—a friend even, insofar as she could even think in those terms. An innocent who didn't even know his secret. Who was

Rakshi Sengupta, next to monsters and cancers and a whole world on the brink? What was her grudge, next to all these other terrors closing in on all sides?

It was a rhetorical question, of course. Sure the universe was full of terrors.

She was the only one he'd brought upon himself.

His own hunt wasn't going so well.

Of course, *Portia* wasn't quite so visible a target as Daniel Brüks. Brüks couldn't subsist on the ambient thermal energy of bulkhead atoms vibrating at room temperature, couldn't flatten himself down to paper and wrap himself around a water pipe to mask even that meager heatprint. He'd wondered about albedo or spectro, wondered if a probe built of very short wavelengths might be able to pick up the diffraction gratings that *Portia* used to talk—perhaps it used them as camouflage as well—but the improvised detectors he fabbed turned up nothing. Which didn't mean they didn't work, necessarily. Maybe it only meant that *Portia* kept to the *Crown's* infinite fractal landscape of holes and crannies too small for bots and men.

He was almost certain it couldn't launch an open attack without letting some tell slip beforehand: the heat signature of muscle analogs building a charge, the reallocation of mass sufficient to construct an appendage at some given set of coordinates. It could *run*, though, in some sort of postbiological baseline state, powered by the subtle energy resonating from the crude mass of the real substrate into the superconducting intelligence of the false one. It could think and plan forever in that mode, if Bicameral calculations had been right. It could hide.

The less he found, the more he feared. Something nearby was watching him; he felt it in his gut.

"Ship's too damn noisy," he confided to Sengupta. "Thermally, allometrically. *Portia* could be anywhere, everywhere. How would we know?"

"It's not," she told him.

“Why so sure? *You* were the one who warned me, back when —”

“I thought it might have got in yah. Maybe it did. But not enough to get everywhere it didn’t coat *everything*. It didn’t swallow us.”

“How do you know?”

“It wanted to keep us in Icarus. It wouldn’t have tried to stop us from leaving if we were still inside it. It’s not everywhere.”

He thought. “It could still be *anywhere*.”

“Yah. But not enough to take over, just a—a little bit. Lost and alone.”

There was something in her voice. Almost like sympathy.

“Yah well why not?” she asked, although he had said nothing. “We know how that feels.”

. . .

Sailing up the center of the spine, navigating through the grand rotating bowl of the southern hemisphere, up through the starboard rabbit hole with the mirrorball gleaming to his left: Daniel Brüks, consummate parasite, finally at home in the weightless intestines of the *Crown of Thorns*. “I checked the numbers three times. I don’t think *Portia*—”

He stopped. His own face looked down at him across half the sky.

Oh fuck—

Rakshi Sengupta was a presence near the edge of vision, a vague blur of motion and color more felt than seen. He had only to turn his head and she would come into focus.

She knows she knows she knows—

“I *found* the fucker,” she said, and there was blood and triumph and terrible promise in her voice. He could not bring himself to face her. He could only stare at that incriminating portrait in front of him, at his personal and professional lives scrolling across the heavens big as the zodiac: transcripts, publications, home addresses; Rhona, ascendant; his goddamn

swimming certificate from the third grade.

“This is him. This is the asshole who killed my—who killed seven thousand four hundred eighty-two people. Daniel. Brüks.”

She was no longer talking like Rakshi Sengupta, he realized at some horrible remove. She was talking like someone else entirely.

“I said I would find him. And I found him. And here. He. Is.”

She’s talking like Shiva the fucking Destroyer.

He floated there, dead to rights, waiting for some killing blow.

“And now that I know who he is,” Shiva continued, “I am going to survive that thing on the hull and I am going to survive that thing in Colonel Carnage’s head and I am going to make it back to Earth. And I will hunt this fucker down and make him wish he had never been born.”

Wait, what—?

He forced back his own paralysis. He turned his head. His pilot, his confidante, his sworn nemesis came into focus. Her face, raised to the heavens, crawled with luminous reflections of his own damnation.

She spared him a sidelong glance; her lips were parted in a smile that would have done Valerie proud. “Want to come along for the ride?”

She’s toying with me? This is some kind of twisted—

“Uh, Rakshi—” He coughed, cleared a throat gone drier than Prineville, tried again. “I don’t know—”

She raised one preemptive hand. “I know, I know. Priorities. Counting chickens. We have other things to do. But I’ve had friends wiped by the storm troopers for hacking some senator’s *diary*, and then *this* asshole racks up a four-digit death toll and those same storm troopers *protect* him, you know what I mean? So yah, there are vampires and slime molds and a whole damn planet coming apart at the seams but I can’t do anything about that.” Her gaze on the ground, she pointed to the sky. “*This* I can do something about.”

You don’t know who I am. I’m right here in front of you and you’ve dredged up my whole sorry life and you’re not putting it

together how can you not be putting it together?

“Bring back a little balance into the social equation.”

Maybe it's the eye contact thing. He suppressed a hysterical little giggle. *Maybe she just never looked at me in meatspace...*

“There's no fucking justice anywhere, unless you make your own.”

Wow, Brüks thought, distantly amazed. Jim and his orthogonal networks. They really got your number.

Why don't you have mine?

“What did they do to her? Why doesn't she know me?”

“Do...?” Moore shook his head, managed a half smile under listless eyes. *“They didn't do anything, son. Nobody does anything, we're done to...”*

The lights were always low in the attic, the better for Moore to see the visions in his head. He was a half-seen half-human shape in the semidarkness, one arm tracing languid circles in the air, all other limbs entwined among the rafters. As though the *Crown* was incorporating him into her very bones, as though he were some degenerate parasitic anglerfish in conjugal fusion with a monstrous mate. The smell of old sweat and pheromones hung around him like a shroud.

“She found out about Bridgeport,” Brüks hissed. *“She found out about me, she had all my stats right up there on the screen, and she didn't recognize me.”*

“Oh that,” Moore said, and nothing else.

“This goes way beyond some tweak to protect state secrets. What did they do? What did you do?”

Moore frowned, an old man losing track of seconds barely past. *“I—I didn't do anything. This is the first I've heard of it. She must have a filter.”*

“A filter.”

“Cognitive filter.” The Colonel nodded, intact procedural memories booting up over corrupt episodic ones. *“Selectively interferes with the face-recognition wetware in the fusiform gyrus. She sees you well enough in the flesh, she just can't*

recognize you in certain...contexts. Triggers an agnosia. Probably even mangles the sound of your name..."

"I know what a cognitive filter is. What I want to know is why someone took explicit measures to keep Rakshi from recognizing me when *nobody knew I was going to be on this goddamn ship*. Because I just *happened* to go on sabbatical just before a bunch of postals decided to duke it out in the desert, right? Because I just *happened* to be in the wrong place at the wrong time."

"I was wondering when you were going to figure that out," Moore said absently. "I thought maybe someone had spiked your Cognital."

Brüks hit him in the face.

At least he tried to. Somehow the blow went wide; somehow Moore was just a little left of where he'd been an instant before and his fist was ramming like a piston into Brüks's diaphragm. Brüks sailed backward; something with too many angles and not enough padding cracked the back of his skull. He doubled over, breathless, floaters swarming in his head.

"Unarmed biologist with no combat experience attacking a career soldier with thirty years in the field and twice your mitochondrial count," Moore remarked as Brüks struggled to breathe. "Not generally a good idea."

Brüks looked across the compartment, holding his stomach. Moore looked back through eyes that seemed a bit more focused in the wake of his outburst.

"How far back, Jim? Did they drop some subliminal cue into my in-box to make me choose Prineville? Did they *make* me fuck up the sims and kill all those people just so I'd feel the urge to get lost for a while? Why did they want me along for the ride anyway, what possible reason could a bunch of superintelligent cancers have for taking a cockroach on their secret mission?"

"You're alive," Moore said. "They're not."

"Not good enough."

"*We're* alive, then. The closer you are to baseline, the better your odds of surviving the mission."

“Tell that to Lianna.”

“I wouldn’t *have* to. I’ve told you before, Daniel: *roach* isn’t an insult. We’re the ones still standing after the mammals build their nukes, we’re the ones with the stripped-down OS’s so damned simple they work under almost any circumstances. We’re the goddamned Kalashnikovs of thinking meat.”

“Maybe it wasn’t the Bicams at all,” Brüks said. “Maybe I’m Sengupta’s paycheck. That’s how you operate, isn’t it? You trade in ideology, you exploit passion. Sengupta does her job and you remove the blinders and let her loose to take her revenge.”

“That’s not it,” Moore told him softly.

“How do you know? Maybe you’re just out of the loop, maybe those orthogonal stealthnets are running you the way you think you’re running Rakshi. You think everyone on the planet’s a puppet *except* for Colonel Jim Moore?”

“Do you really think that’s a likely scenario?”

“Scenario? I don’t even know what the goddamned *goal* is! No matter who’s pulling the strings, what have we *accomplished* other than nearly getting killed a hundred fifty million clicks from home?”

Moore shrugged. “God knows.”

“Oh, *very* clever.”

“What do you want from me, Daniel? I’m not much more clued in than you are, no matter what Machiavellian motives you want to lay at my feet. The Bicamerals see God in everything from the Virgo Supercluster to a flushing toilet. Who knows why they might want us on board? And as for Rakshi’s *filter*—how do you know your own people didn’t do it?”

“My own people?”

“Public Relations. Faculty Affairs. Whatever your academic institutions use to keep their dirty laundry out of the public eye. They did a lot of mopping up after Bridgeport; how do you know Rakshi’s tweak wasn’t just another bit of insurance? Preemptive damage control, as it were?”

“I—” He didn’t actually. The thought hadn’t even occurred to him.

“Still doesn’t explain why we both ended up on the same mission,” he said at last.

“*Why.*” The Colonel snorted softly. “We’re lucky if we even know *what* we’ve done. Any *why* simple enough for either of us to consciously understand would certainly be wrong.”

“Just not enough room in the cache,” Brüks said bitterly.

Moore inclined his head.

“So it’s just God’s will. All these augments and all this technology and four hundred years of so-called *enlightenment* and you still just come around to *God’s will.*”

“For all we know,” Moore said, “your presence on the mission is the *last* thing God wants. Maybe that’s the whole point.”

Sengupta’s voice in his head: *Maybe worship. Maybe disinfect.*

Lazily, almost indifferently, Jim Moore disentangled himself from the rafters and moved spiderlike around the attic. Even in this artificial twilight Brüks could see the slow change in his eyes, the focus deepening in stages: into Brüks’s eyes, then past them; through the bulkhead, through the hull; past planets and ecliptics, past dwarfs and comets and transNeptunians, all the way out to some invisible dark giant lurking between the stars.

He’s gone again, he thought, but not entirely: Moore dropped that distant gaze from Brüks’s face, took his hand, pointed to a freckle there that Brüks hadn’t noticed before.

“Another tumor,” Brüks said, and Moore nodded distantly:

“The wrong kind.”

The sun diminished behind them; they jettisoned the parasol. Ahead, just a few degrees starboard, the Earth grew from dimensionless point to gray dot, edging infinitesimally closer to twelve o’clock with each arbitrary shipboard day. The solar wind no longer roared across every frequency; it spat and hissed and gave way to other voices, infinitely weaker but so much closer to the ear. Jim Moore continued to feed on the archives that carried his son; Sengupta squeezed signal from noise and insisted that other patterns lay embedded there, if she

could only decipher them.

But the ghost that called itself Siri Keeton was only one voice on the ether. There were others. Far too many for Brüks's liking.

The world they'd left behind had been almost voiceless, scared into silence by the memory of regimented apparitions burning in the sky. But the voices were coming back now: the rapid-fire click-trains of encrypted data; grainy approximations of faces and landscapes flickering along the six-hundred megahertz band; the hiss of carrier waves on reawakened frequencies, nominally active but holding their tongues as if waiting for the firing of some starting pistol. A myriad of languages; a myriad of messages. Weather reports, newsfeeds rotten with static, personal calls connecting families scattered across continents. The content of the signals wasn't nearly so troubling as their very existence, out here in the unshielded wastes. They should have been trapped in lasers and fiberop, should have been winking confidentially between lines of sight. These, these *broadcasts* were relics of another age. The airtight machinery of twenty-first century telecommunications had begun leaking at the seams; people were falling back into more patchwork technologies.

It was what a brain might do, stunted for want of nutrients and oxygen. It was the predictable decoherence of any complex system starved of energy.

But it was home, and they were almost there. There was groundwork to be laid; Moore and Sengupta attended to the details, each returning from whatever far-off places they ventured when not guiding the *Crown* into port. The warrior divided the rest of his time between his tent and the attic; the widow continued to sleep obliviously with the enemy. The vampire lay like a fossil on the hull, undisturbed by whatever alarms or tripwires she might have put in place. Brüks measured the time to Earth by the size of its disk and the incremental unclenching of his own gut. He thought about getting back into gaming, briefly. He slept and dreamt his lucid dreams, but Rhona would not come to him and he no longer

had the heart to seek her out. The guts of the *Crown* continued to not grow tentacles.

He finished the last of the Glenmorangie by himself, toasting his lab bench while they crossed lunar orbit. If anyone even noticed their return, they were too busy to send a welcoming committee.

TO TRAVEL HOPEFULLY IS A BETTER THING THAN TO
ARRIVE.

—ROBERT LOUIS STEVENSON

LOW FAST ORBIT over a world in flames.

A thousand cool political conflicts had turned hot while they'd been away. Twice as many epidemiological and environmental ones. A myriad of voices cried out on long-forgotten radio bands from kilohertz to giga, tightbeams swamped, planetary gag orders rescinded or forgotten. The O'Neils were under quarantine. The space elevator had collapsed; burning wreckage still fell from orbit, wrought untold havoc along a splatter cone wrapped around a third of the equator. Jet-stream geoengineering had finally buckled beneath the weight of an insatiable atmosphere. Atlas had lost the strength to hold the heavens from the earth; atmospheric sulfates were plummeting and firestorms sparkled endlessly across six continents. Pretoria, Bruges, a hundred other cities had been overrun by zombies, millions reduced to fight/flight/fuck and the authorities weren't even *trying* to control anything inside the hot zones. There was no end to the claims or the confusion. Icarus had fallen. The Fireflies had returned. The invasion had begun. The Realists had struck. The Bicamerals had destroyed the world.

Moore listened to the tsunami along with Brüks and Sengupta—all three of them strapped into the mirrorball on approach—

and his face was impassive as a corpse's. *This is your doing, Brüks did not say. This was a world just making ends meet until you snatched away its biggest asset. All those millions kept barely watered by power-hungry desalinators; all those uprisings kept barely in check by the threat of institutional force; all those environmental catastrophes kept barely at bay by the sheer overwhelming application of brute-force technologies. Icarus carried a solid fifth of our civilization on its back: what did you think would happen when you threw it into the sun?*

Even Sengupta said nothing. There would have been no point.

Enemy territory. Couldn't be helped.

Maybe Moore was even right. The world had been simmering for over a century. It had always only been a matter of time before it boiled over. Maybe he hadn't done anything but advance the schedule by a few months.

"Got it," Sengupta said. "Just came line of sight over the Aleutians whole lotta junk between there and here."

A tactical profile flashed up on the horizon: a cylinder ten meters across and maybe thirty long, a great broad corona of solar panels deployed from the starside end and a cluster of mouth parts—microwave emitters, from the look of them—jutting down from the other. It looked like an old-style powersat, albeit in a very strange orbit. Which was, of course, the whole idea.

"Be tricky docking with that thing." Off to one side a simulacrum of the *Crown* lazily lowered its remaining arms—spread-eagled but already spun down—into lockdown position.

"We don't dock," Moore reminded her.

"How long?" Brüks asked.

"Thirty minutes, give or take. We should bottle up."

The attic was not designed to be a working environment during maneuvers but they'd made do, one survivor strapped into each of three suit alcoves directly across from the docking hatch. Brüks and Moore had welded it shut somewhere past Venus but it had been Sengupta who'd planted the thermite along those seams just six hours ago. There wasn't much

bulkhead to spare so Sengupta, still unwilling to let ConSensus into her head, had stripped the tool rack bare and slathered smart paint across the gecko boards. The microfibers fuzzed the image a little at high rez but the space was big enough to contain the windows she needed: radar profiles and trajectory overlays, engine vitals, throttles and brakes in shades of gold and emerald. A naked-eye view of Moore's last ace up the sleeve, still posing a little too convincingly as decommissioned junk, swelling slowly against the deceptively blue-green crescent of a world falling into ever-greater depths of disrepair.

In a dedicated window, stage right: Valerie, still tied to the mast. She hadn't moved in weeks; and yet there was still a vague sense of lethality in that frozen body, a sense of something spring-loaded and biding its time.

Its remaining time. Measured in minutes now.

A gentle nudge; a slow, steady pressure pushed Brüks against the side of the alcove. Over on the tool rack the *Crown's* avatar turned one hundred eighty ponderous degrees around its center of mass and coasted on to retrograde.

"Hang on," Sengupta warned, and hit the brakes.

Mutilated, amputated, cauterized, the ship groaned and ground down the delta-vee. Deceleration pushed Brüks against the floor of his alcove. He staggered; the harness held him *up* against this final encore performance of *down*. Moore touched some unseen control and out across the vacuum his chameleon satellite split at the seams like an exploding schematic: solar panels and radiator vanes came apart in puffs of vapor turned instantly to snow. The shell fell apart as if drawn and quartered; body parts sailed silently in all directions. A great arrowhead, aimed at the earth, floated exposed where the false skin had come apart. It glinted in the rising sun, its stubby wings iridescent as a dragonfly's.

Flying debris rattled across the *Crown's* hull like a hail of pebbles. Moore waited until the shower had passed and hit the switch.

Cracks of sunlight ignited around the hatch: the barrier there, welded shut, burned open and fell away. The hatch beyond

dilated in an instant; a brief hurricane pulled the plating into space and Brüks toward the stars. The webbing held him fast for the moment it took Moore to snap the buckles. Then they were through and into a void silent but for the sound of fast harsh breathing, just this side of panic, filling Brüks's helmet. The dark Earth spread out below: too convex for mere landscape, too vast and imminent to be a sphere. Weather systems laid dirty fingerprints across its face. Coastlines and continents shone like galaxies where civilization burned bright, flickered dull and intermittent orange where it had burned out.

It was such a long way down.

Sunlight turned the flotsam ahead into a blinding jigsaw, save for one brief instant when a great dark hand passed over the sun. Brüks flailed and turned to see the *Crown of Thorns* in passing, still huge in the sky, backlit against a risen sun and a bright spreading crescent. Her last frozen breath sparkled near the bow like a faint cloud of jewels.

He could not see Valerie's hiding place from here.

Something yanked at his leash. Brüks spun to heel, to the shuttle swelling in his sights amid its cloud of debris. "*Focus,*" Moore hissed over comm.

"Sorry—"

They tumbled forward, Moore in the lead, the others dragged behind. The shuttle's hatch gaped just behind the wraparound cockpit window, like a frog's eardrum cut away and folded back against the head. Some magical spray-on ablative made the hull shimmer with oily rainbows.

A faint static of ice crystals whispered across Brüks's helmet; then Moore was on the hull, dead on target, boots coming down between the edge of the hatch and a convenient handhold welded like a towel bar to the shuttle's skin. His legs bent to absorb the impact; one gloved hand seized the handhold as if it had eyes of its own. Brüks sailed past overhead and splatted against the fuselage. He bounced, spun against the tether, grasped wildly at the recessed cone of some dormant maneuvering thruster just a few centimeters out of reach—finally felt his boots click home against the hull.

The *Crown* was well past and well below them now, drifting in a slow majestic tumble toward the terminator: forward momentum stalled, decelerating from the endless satellite fall *around* to the terminal incendiary fall *into*. Distance and the limits of vision had healed its scars. Now—torn apart, spliced back together, burned and broken—she looked almost pristine. *You kept us alive*, Brüks thought, and then: *I'm sorry*.

Moore yanked him out of one moment and into the next, reeling Brüks and Sengupta in together like fish on a line. Brüks spared a moment to envy the pilot's composure; she hadn't made a sound, hadn't even breathed hard during their fall across the endless chasm. Only now, peering into her faceplate, did he see her lips move below tightly clenched eyelids. Only now, bumped helmet to helmet, could he hear her incantation.

“—oh fuck oh fuck oh fuck—”

You little chickenshit. You turned off your comm...

Moore bundled her through the open hatch. Brüks followed, pulling himself into the cabin: two racks, one behind the other, each holding six acceleration couches like a half-dozen eggs in the carton. The couches themselves were squashed nearly flat, each bent just enough at the ass and the knees to avoid being classified as *cots*; the racks faced forward toward a pair of more conventional command chairs and a control horseshoe. Above those controls a visor of quartz glass ran around the front of the cockpit. No stars shone in that nose-down view; the world filled it from side to side, mostly dark, brightening to starboard.

That was pretty much it. One hatch in the aft bulkhead and a smaller one in the deck, both sealed. The first might have led to a cargo hold—a very modest one, given the size of the vessel—but that hole in the deck couldn't have led to anything more spacious than a service crawlway. Contingency orbital extraction, Moore had said. Emergency planetfall for soldiers stranded in the wake of failed missions. This wasn't a shuttle: it was a glorified parachute to be used once and thrown away.

Moore had sealed the hatch and pushed himself into one of the command chairs; Sengupta, recovered from her brief catatonia, fumbled into the other. Brüks strapped himself into

one of the hamburger racks behind as their ride booted up. Outside sounds came back to him, faint as a whisper at first, barely audible above the breath of his helmet regulator and the murmured recitation of preflight checklists coming over comm. The hiss of compressed gas. Tiny clicks and beeps, muffled as if under pillows. The snap of ancient switches in their sockets.

70 KPA, HUD reported. He unsealed his visor and slid it back: cold as a glacier in his lungs, the taste of plastic monomers at the back of his throat. Breathable, though.

Moore twisted against his straps, couldn't quite turn to line of sight. "Better keep that down. This bird's been up here a while; could be some leaks."

For the first time Brüks focused his attention on the dashboard: single-function LEDs, rows of manual switches big enough for hands wrapped in Mylar and urethane. Tactical displays trapped in embedded panes of crystal, instead of flowing freely across whatever real estate the moment required.

He brought his visor back down. "This thing is *ancient*."

Moore grunted over comm. "Older it is, the better the odds everyone's forgotten about it."

We've traded one derelict for another. Past the viewport something flared in the corner of Brüks's eye: sunlight bouncing off a piece of orbital debris, maybe. Or perhaps the thrusters of some distant ship. But it burned too long for one and too low for the other, and the wrong color for either. When he turned to face it, squinting against the sun, he could almost swear he saw the core inside the contrail: a dark jagged patchwork coming apart in a line of fire etching its way across the face of the planet. Sticks and bones, turning to ash.

"There she goes," Moore said softly, and Brüks wasn't quite sure whether he meant the monster or the machine.

"Ignition," Sengupta said as they too began to fall.

The *Crown* burned cleanly. Nothing escaped. No spacesuited figure roused itself at the last moment to leap miraculously free of the hull, although Sengupta's camera watched it until the

end. A limb may have twitched, just before the feed died—a brief flicker of consciousness passing through a body just long enough to sense that something had gone wrong with its best-laid plans—but even that could have been a trick of the light. The anticlimax left a guilty lump in Brüks's throat. The ease with which they'd murdered Valerie somehow made her less of a threat in hindsight, stole the justification from their crime.

He barely remembered their descent: frictional incandescence flickering across the windshield like sheet lightning; static hissing on every channel until he remembered to shut down his radio. Fragments, really. Disconnected images. At some point weight returned, stronger and steadier than it had been for a hundred years; racks and acceleration couches and a lone cockroach folded up into conventional sitting positions against a vibrating deck that Brüks could finally perceive as a *floor*. Then they were gliding in a wide spiral over a steely gray ocean and the sun had dropped back below the horizon. Something listed on the seascape below, glimpsed in split-second snatches as it slipped back and forth across the windshield: a half-submerged jump-ramp for water-skiers; a flooded parking lot; the disembodied corner of an aircraft carrier, flickering with Saint Elmo's fire. Brüks got no sense of scale from this altitude, and after a few moments the ocean dropped from sight as Sengupta lifted the nose for final approach.

Something kicked them hard from behind, threw Brüks forward against the harness and brought the nose down with a *slap*. Walls of white spray geysered just past the port, split down the centerline; an instant later the view shattered and dissolved behind sheets of water running down the quartz. Something punched the shuttle under the chin; it bucked back and screamed along its length like an eviscerated banshee. Now they were climbing again. Now they were slowing. Now they were still.

Sheets of water contracted to runnels, to droplets. The shuttle squinted past them to a few fading stars in a steel sky. Way off to the left, almost past line of sight, something flickered in and out of view like a half-remembered dream. Some kind of

antennae, perhaps. A wire-frame tree.

Moore dislocated his helmet and let it roll to the deck. "Here we are."

Someone had carved a landing strip out of thin air.

It hung four or five meters above the waves, a scorched scarred tongue of alloy with the shuttle at its tip. It extended back to solid land like some kind of absurd diving board—except the substrate wasn't land, and it wasn't solid. It emerged from the ocean as gradually as a seashore; electric blue sidewinders writhed and sparked along the waterline, followed the swells as they surged up and down the slope. The surface seemed gray as cement in the predawn half-light, and almost as featureless except for the scored tracks the shuttle had left. But while it rose from the sea as unremarkably as a boat ramp at one end, it did not subside or drop off or reimmerge at the other: it just *faded away*, a massive slab of listing alloy big as a parking lot, segueing from solid undeniable opacity to spectral translucence to *nothing at all* over a distance of maybe a meter and a half.

Except for this runway, freshly sculpted by the screaming friction of a hot landing.

Moore had already shed his spacesuit and was standing on thin air, ten meters ahead of the grounded shuttle. Bitter gray swells marched past below his feet. Every couple of seconds a wire-frame structure flickered into existence nearby, towering six meters over his head and infested with parabolic antennae.

Brüks leaned out the hatch and took it all in. The frigid Pacific wind blew through his jumpsuit as though he were naked. The earth pulled at him with a force he'd almost forgotten; his arms, bracing him against the bulkhead, seemed made of rubber.

Sengupta poked him from behind. "Hurry *up* roach you never seen chromatophores before?"

In fact, he had. Chroaks were basically just a subspecies of smart paint. But he'd never encountered one on this *scale*

before. "How big is this thing?"

"Pretty small only a klick across look you want to get off before the damn thing sinks the rest of the way?"

He squatted, grabbed the lip of the hatch, clambered overboard. Gravity almost tipped him on the landing but he managed to keep his feet under him, stood swaying with one hand braced against the hull (still warm enough for discomfort, even after being soaked by an ocean). This close to the shuttle the cloak had been thoroughly scored away, but a half-dozen uncertain steps took him onto a substrate clearer than glass. He looked down onto a wave-tossed sea, and fought the urge to flail his arms.

Instead, he walked carefully toward Moore as Sengupta climbed down behind him. Flickering orange light caught his eye as he rounded the nose of the shuttle: fire in the near distance, a guttering line of flames atop an incongruous levitating patch of scorched earth. Brüks could make out superstructure silhouetted there: low flat-topped rectangles, a radio dome cracked open like an eggshell, the barely visible crosshatch of railings and fence posts against the fire. Maybe something moving, ant-size with distance.

Not your average gyland, this. Not a refugee camp or a city-state, no iffy commercial venture with a taste for the forgiving regulatory climate of International Waters. This was a place for Moore and his kind: a staging ground for covert military actions. A lookout on the high seas, patrolling the whole Northern Gyre. Clandestine.

Not clandestine enough, apparently.

He shivered at Moore's shoulder. "What happened here?"

The Colonel shrugged. "Something convenient."

"How so?"

"It's been abandoned. We won't have to talk our way in."

"Is it still plugged in? What if it—"

Moore shook his head. "Shouldn't be a problem. Nobody who'd have done this would care about Heaven." He pointed at the distant flames. "That way."

Brüks turned as Sengupta came up behind them; the shuttle

cooled in the background, half-melted ablative oozing like candle wax around its belly. "Huh," he remarked. "I'd have thought there'd be, you know. Landing gear."

"Too expensive," Moore told him. "Everything's disposable."

You got that right.

A halting, freezing hike up a shallow slope. A walk on the water. An invisible bridge to the visible tip of a derelict iceberg. Guttured structures spread out before them like little pieces of Gehenna, some still aflame, others merely smoldering. Finally they reached the visible edge of that levitating island: little more than a patina of black greasy soot floating in midair. It was still a relief to see something underfoot; it was a greater relief to stop and catch his breath.

Moore laid a sudden hand on his shoulder. Sengupta said, "*Wha—*" and fell silent.

Ahead, barely visible through a curtain of oily smoke, things moved.

They'd arrived at what had once been some kind of air-traffic hub: a low-slung control shack whose walls and roof came together in a wraparound band of soot-stained windows angled at the sky. Two dead helicopters and a one-winged jump jet littered a scorched expanse of tarmac and landing bull's-eyes, barely visible beneath the scoring. The nozzles of retracted fuel lines poked through the deck here and there; one burned fitfully, a monstrous candle or a fuse set to detonate whatever reservoir fed the flame. In the middle of it all, bodies moved.

The bodies were human. Their movements were anything but.

Moore waved the others back against the shack, spared a backward glance and a raised hand: *Stay here*. Brüks nodded. Moore slipped around the corner and disappeared.

A swirling gust blew sparks and acrid smoke into Brüks's face. He suppressed a cough, eyes stinging, and squinted through the haze. Human, yes. Two, maybe three, near the edge of one of the bull's-eyes. Gray coveralls, blue uniform, insignia impossible to make out from this distance.

They were *dancing*.

At least, that was the closest word Brüks could summon to describe the tableaux: movements both inhumanly precise and inhumanly *fast*, humanoid simulacra engaged in some somatic call-and-response unlike anything he'd ever seen. There was a lead, but it kept changing; there were steps, but they never seemed to repeat. It was ballet, it was semaphore, it was some kind of *conversation* that engaged every part of the body except the tongue. It was utterly silent but for the machine-gun staccato of boots on the deck, faint and intermittent through the soft roar of the wind and the crackling of the flames.

And faintly familiar, somehow.

Moore ended it all with a blow to the back of the head. One moment the dancing marionettes were alone on the stage; the next the Colonel had materialized from the smoke, his hand already blurring toward the target. The gray-clad dancer jerked and thrashed and collapsed twitching onto the deck, a disconnected puppet gone suddenly grand mal; the other threw himself down at the same instant, although Moore hadn't touched him. He lay twisting beside his fallen partner, still in frantic clockwork motion but only twitching now, amplitude reined in to complement these new and unexpected steps brought so suddenly into the routine.

"Echopraxia echofuckingpraxia," Sengupta hissed at his shoulder.

Moore was back. "This way."

A broken door gaped around the corner. Inside, brain-dead smart paint sparked and sizzled along those few control surfaces that hadn't already been put to the flame.

Brüks glanced over his shoulder. "What about—"

"They're in a feedback loop. We don't have to worry until the mechanic comes back." A companionway gaped from the far bulkhead. A fallen cabinet blocked the way. Moore pushed it aside.

"Isn't that bad for them?" Brüks wondered, and immediately felt like an idiot. "I mean, wouldn't it be better if we broke the loop? Split them up?"

Moore paused at the top of the stairs. "Best-case scenario,

they'd do as well as you would if someone split you down the middle."

"Oh." After a moment: "Worst-case?"

"They wake up," Moore said, "and come after us."

YOU CAN'T GO HOME AGAIN.

—THOMAS WOLFE

THEY CAME ACROSS a sloping commons area, dark and derelict but for a cone of emergency light spilling in from the corridor and a smattering of icons winking fitfully from the far bulkhead: a row of comm cubbies, snoozing until some lonely grunt chose to phone home or eavesdrop on the happening world. They could only access Main Street—no windows into anything that might require security clearance—but ConSensus and perscomm links floated free to one and all, serenely untroubled by whatever small apocalypse had taken out the upper deck.

Moore moved on in search of greater privilege and darker secrets. Sengupta hung around long enough to make sure the links were solid before disappearing in his wake.

Brüks sat in the leaning darkness and did not move.

What do I say to her? What do I say?

Hey, you know how Icarus went away and the world fell apart? Funny story...

You know how we thought there was no God? Well, it's worse than you think...

Hi, honey. I'm home.

He took a deep breath.

This is a stupid idea. We're way past this. I should just—catch up with the others.

Let it out again.

Someone has to tell her. She needs to know.

He felt the corners of his mouth pull back in a grimace of

self-loathing.

This isn't even about her. This is about Dan Brüks and his imploding worldview. This is about running back to the only person who ever gave you any shred of comfort whether you deserved it or not...

He sacc'ed the interface.

He tried four times before the system could even find the address; the lump in his throat grew with each attempt. The Quinternet was falling apart; *everything* was. But it had deep roots, old roots reaching back over a century: a design both completely uncephalized and massively redundant. Functionality in the face of overwhelming entropy had been built into its DNA from the start.

LINK ESTABLISHED: WELCOME TO HEAVEN
TIMMINS FRANCHISE
VISITOR'S LOBBY

Still there. Still online. Still alive. He hadn't entirely believed it.
"Uh, Rhona McLennan, November 13, 2086."

PINGING.

Please pick up.

PINGING

Please be busy.

PINGING

"Dan."

Oh God. Here she is.

I must be dreaming...

"Hi, Rho."

"I wondered where you'd got off to. Things have been so confused out there lately..."

She was a voice in the darkness, distant, disembodied. There

was no visual.

"I'm sorry I haven't been in touch..."

"I wasn't *expecting* you to get in touch." Maybe there was warmth in her voice now. Wry amusement at least. "When was the last time you dropped by?"

"You didn't *want* me to drop by! You said—"

"I said I wasn't going to come back out, love. I said I didn't want you to spend all our time together trying to change my mind."

He didn't say anything.

"I'm glad you *did* come by," she said after a while. "It's good to see you."

"I can't see you," he said softly.

"Dan. What would be the point?"

He shook his head.

"Is it important? I could show you—something. If that would make it any easier."

"Rho, you can't stay in there."

"I'm not having this argument again, Dan."

"*This is not the same argument!* Things have *changed*..."

"I know. I'm in Heaven, not Andromeda. I can see everything out there that I want to. Upheaval, rebellion, environmental collapse. *Plus ça change*."

"It's a loss worse since Icarus went down."

"Yeah," she said slowly. "Icarus."

"Everything's stretched to the breaking point, there're outages and brownouts everywhere you look. Took me four tries to even *find* you, did you know that? And Heaven's hardly the most obscure address on the planet. The whole network's—forgetting things..."

"Dan, it's been forgetting things for ages. That's why we call it the Splinternet."

"I didn't know you called it that," he said, vaguely surprised.

"How is an elephant like a schizophrenic?"

"I—what?"

"An elephant never forgets."

He said nothing.

"That's an AI joke," she said after a while.

"Could be the worst one I've ever heard."

"I got a million of 'em. You sure you want me to come back out?"

More than ever.

"But really, how long do you think *you* could stay sane if you remembered everything you'd ever experienced? It's *good* to forget, no matter what kind of network you are. It's not a breakdown, it's an *adaptation*."

"That's bullshit, Rho. Losing network addresses is a *good* thing? What's next, the voltage protocols? What happens when the grid *forgets* to shunt power to Timmins?"

"There are risks," she said gently. "I get it. The backups could fail. The Realists could strike. The AIRheads probably still want me for war crimes just on general principles, and I can't say I really blame them. Every day in here could be my last, and how's that any different from life out there?" Some tiny lens sent her the sight of Daniel Brüks opening his mouth; she rushed on, preempting him: "I'll tell you. I don't have anything anyone could want. I'm not a threat to anyone. My footprint's a tiny fraction of yours, even factoring in your kink for spending so much time in tents. I can experience literally everything in here that you can out there, and a billion other things besides. Oh, and one other thing."

She paused some precise number of milliseconds.

"I don't have to kill intelligent beings to pay the rent."

"Nobody's saying you'd have to—"

"Now let's look out *there*, shall we? Infectious zombieism running rampant in at least twenty countries I know of. Realists and Rearguard Catholics taking shots at any heretics they can lay their crosshairs on. Food poisoning on the rise for anyone who can't afford a consumables-class printer. They haven't even *bothered* tracking species extinction rates for a decade now, and—oh, and have you heard about that new weaponized echopraxia that's going around? *Jitterbug*, they call it. Used to be pure monkey-see-monkey-do, but they say it's mutating. Now you get to die dancing, bring a friend along for the ride."

"The difference," he said grimly, "is that when the power fails out here, you can curl up under a blanket. If it fails in Heaven you're brain-dead in five minutes. You're *helpless* in there, Rhona, and it's all just a house of cards waiting for..."

She didn't answer. He couldn't finish.

He wondered how much she'd changed already, how much of her remained behind that gentle, utterly unyielding and unreal voice. Was he even talking to an intact brain, or to some hybrid emulation of neurons and arsenide? How much of his wife had been replaced over the past two years? That incremental cannibalism, that ongoing fossilization of flesh by minerals—it had always scared the living shit out of him.

And she *embraced* it.

"I've seen things," he told her. "World-shaking things."

"We all have. It's a shaky world."

"Will you just shut up and *listen* to me? I'm not talking about the goddamned news feeds, I'm talking about things that—I've seen things that—I know why you went away now, you know? I finally get it. I never did before, but right now I swear I'd join you in a second if I could. But I can't. It doesn't feel like transcendence to me, it doesn't feel like rising into some better world, it feels like being—*replaced*. I mean, I can't even stand to have a ConSensus augment in my head. It's like anything that changes what I am *kills* what I am. Do you understand?"

"Of course. You're scared."

He nodded miserably.

"You've always been scared, Dan. As long as I've known you. You've spent your whole life being an asshole just to keep people from finding out. Lucky for you I could see through it, mmm?"

He said nothing.

"Know what else I see?"

He didn't. He didn't have a clue.

"That's what makes you brave."

It took a moment for that to sink in. "What?"

"You think I don't know? Why you keep mouthing off to the wrong people? Why you sabotaged your own career every step

of the way? Why you can't help but face off against anybody who has any power over you?"

Climbing an endless ladder toward a hungry monster. Charging into a leghold labyrinth with living walls. Biting the head off a girl half his size when she told him he couldn't go home.

Maybe not such a proud moment, that last one...

"You're saying I overcame my fear," he began.

"I'm saying you *gave in* to it! Every time! You're so scared of being seen as a coward you'd jump off a cliff just to prove you weren't! You think I never saw it? I was your *wife*, for God's sake. I saw your knees knocking every time you ever stood up to the schoolyard bully and got your teeth kicked in for your troubles. Your whole damn life has been one unending act of overcompensation, and you know something, love? *It's just as well*. Because people *need* to stand up now and then, and who else is going to?"

It didn't sink in at first. All he could do was frown and replay and try to figure out when the conversation had switched tracks like that.

"That has to be the most heartwarming definition of *asshole* I've ever heard," he said at last.

"I liked it."

He shook his head. "It doesn't matter, though. I still can't—follow you..."

"Follow me." Her voice was flat with sudden insight. "You think..."

She won't come out, and I can't go in—

"Dan." A window opened on the wall. "Look at me."

He looked away.

He looked back.

He saw something that resembled a pickled fetus more than it did a grown woman. He saw arms and legs drawn close against the body in defiance of the cuffs at wrists and ankles, of the contractile microtubes that pulled them straight three times a day in a rearguard battle against atrophy and the shortening of tendons. He saw a shriveled face and a hairless scalp and a

million carbon fibers sprouting from the base of the skull, floating like a nimbus around her head.

"This is not what I'm talking about," something said with her voice, and her lips did not move.

"Rhona, why are you—"

"You call this change, but it isn't," the voice said. "Heaven isn't the future. It's a refuge for gutless wonders who want to *hide* from the future, a nature preserve for people who can't adapt. It's, it's wish fulfillment for passenger pigeons. You think I was *lording* this over you? This is nothing but a dumping ground for useless also-rans. You don't belong here."

"Useless?" Brüks blinked, stunned. "Rho, don't *ever*—"

"I ran away. I threw in the towel years ago. But you—you may be doing everything for the wrong reasons and you may be pissing yourself when you do it, but at least you haven't given up. You could be hiding with the rest of us but you're out there in a world with no reset button, a place you have no control over, a place where other people can take your whole life's work and twist it to such horrible ends and there's *no way to ever take back what they did*."

"Rhona—what—"

"I *know*, Dan. Of course I know. You didn't have to hide it from me. You *couldn't* hide it from me, I'm more plugged in than you are." The voice was gentle, and kind, and still the face of that thing did not move. "The moment they quarantined Bridgeport I knew. I almost called you then, I thought maybe you'd finally give up and come *inside* but—"

A mountain smashed into the back of his skull. His forehead smacked the wall of the cubby, rebounded; he toppled backward in his chair and sprawled across the deck. A red-shifted galaxy ignited, pulsing, in his head: light-years away, an upside-down giant stood silhouetted in the doorway.

He blinked, moaned, tried to focus. The starfield dimmed; the roaring in his head faded a little; the giant shrank down to merely life-size. Its depths were so black they almost glowed.

Rakshi Sengupta, meet Backdoor Brüks.

Somewhere far away, a computer called out in the voice of

his dead wife. Brüks tried to bring his hand to his head; Sengupta stomped on it and leaned over him. Fresh pain erupted off the midline and shot up his arm.

“I want you to imagine something, you fucking *roach*.” Sengupta’s fingers danced and dipped overhead.

Oh God no, Brüks thought dully. *Not you, too...* He let his head loll to the side, let his eyes stray somewhere anywhere else; Sengupta kicked him in the head and made him pay attention. Her fingers clenched and interlaced and bent backward so far he thought they’d break.

“Want you to imagine *Christ on the Cross*—”

He was barely even surprised when the spasms started.

Sengupta leaned in to admire her handiwork. Even now she could not look at his face. “Oh yes I have been waiting for this I have been *working* for this I have—”

A sound: sharp, short, *loud*. Sengupta fell instantly silent. Stood up.

A dark stain bloomed on her left breast.

She collapsed onto Brüks like a rag doll. They lay there a moment, cheek to cheek, like slow-dancing lovers. She coughed, tried to rise; sprawled downhill to Brüks’s side. Her dimming eyes focused, unfocused, settled finally on some point near the hatch. Jim Moore stood there like a statue, his eyes so full of grief they might as well have been dead already.

Something crossed Sengupta’s face in that moment. Not happiness, not quite. Not surprise. Enlightenment, maybe. After a moment, for the very first time, she looked Dan Brüks straight in the eye.

“Oh *fuck*,” she whispered as her eyes went out. “Are you ever screwed.”

“I know it doesn’t make any sense,” Moore was saying, turning the gun over in his hands. “We were never close. That may have been my fault, I suppose. Although, you know, he wasn’t what you’d call an *easy* child...”

He’d pulled up a chair, sat hunched and leaning against the

slant with his knees on his elbows, the light from the corridor catching him in quarter-profile. Brüks lay on the floor while Sengupta's blood pooled against his side. It soaked through his clothing, stuck his jumpsuit to his ribs. His head throbbed. His throat was parched. He tried to swallow, was relieved and a bit surprised to find that he could.

"Now, though...he's half a light-year away, and for the first time in his life I feel that we're actually able to *talk*..."

Pale nebulae clouded Sengupta's open eyes. Brüks could see them clearly even in this dim light; could even turn his head a little to bring them into proper focus. Not Valerie's best-laid glitch, not the total paralysis the vampire had layered down with weeks of graffiti and subtle gesticulation—or at least, not the same precision in the trigger stimulus. It probably *was* the same program, the same chain of photons to mirror neurons to motor nerves, still dozing in the back of his head should anyone sound the call to arms; Sengupta must have just improvised after the fact, gone back over old footage, figured out the basic moves and acted them out as best she could.

"It's as though he knew I'd be listening all those months ago, as though he knew what I'd be *thinking* when his words arrived..."

She probably hadn't even been planning for vendetta. It had probably been just another pattern-matching puzzle to keep that hyperactive brain occupied, fortuitously available when it turned out that her wife's murderer and her adopted roach were one and the same. This rigor was half-assed and short-lived; he could feel it in his tendons. The tightness was already beginning to subside.

Still pretty impressive, though.

"I feel closer to Siri than I ever did when we were on the same planet," Moore said. He leaned forward, assessed the living and the dead. "Does that make any sense to you?"

Brüks tried to move his tongue: it barely trembled against the palate. He focused on moving his lips. A sound emerged. A groan. It contained nothing but frustration and distress.

"I know," Moore agreed. "And at first it felt more like just—"

reports, you know? Letters home, but full of *facts*. About the mission. I listened to that signal, oh, I would have listened forever, even if all he'd ever done was tell the tale. I learned so much about the boy, so much I never suspected."

Take two...: "Jim..."

"And then it—changed. As though he ran out of facts and had nothing left but feelings. He stopped the *reportage* and started *talking* to me..."

"Jim—Rak—Rakshi thought—"

"I can even hear him *now*, Daniel. That's the remarkable thing. The signal's so weak it shouldn't even be able to penetrate the atmosphere, especially with all the broadband chatter going on. And yet I can *hear* him, right here in the room."

"Rakshi thought—your zombie switch—"

"I think he's trying to warn me about something..."

"—you might have been—hacked—"

"Something about *you*."

"She said you—you might not be in—control—"

Moore stopped turning the gun in his hands. Looked down at it. Brüks fired every command he could, along every motor nerve in his body. His fingers wiggled.

Moore smiled a sad little smile. "Nobody's in *control*, Daniel. Do you really think you don't have one of these zombie switches in your own head, you don't think *everyone* does? We're *all* just along for the ride, it's the coming of the Lord is what it is. God's on Its way. It's the Angels of the Asteroids, calling the shots..."

Angels again. Divine teleoperators, powerful creatures with neither soul nor will. God's sock puppets.

Jim Moore was turning into one before his eyes.

"What if it's not—Siri?" Brüks managed. His tongue seemed to be thawing a bit. "What if, what if it's something *else*..."

The Colonel smiled again. "You don't think I'd know my own son."

"It knows your son, Jim." *Of course it knows him, it mutilated him, can't you remember the goddamn slide show?* "It knows Siri,

and Siri knows you, and—and it's *smart* Jim, it's so fucking smart..."

"So are you." Moore eyed him curiously. "Smarter than you let on, anyway."

If only.

He wasn't smart enough to get out of this. Not smart enough to outthink some interstellar demon who could hack a man's brain across five trillion kilometers and a six-month time lag, who could trickle its own parasitic subroutines into the host's head and lead him around in real time. Assuming that Moore hadn't just gone batshit crazy on his own, of course. That was probably the most parsimonious explanation.

Not that it mattered. Brüks wasn't smart enough to get out of that, either.

Moore lowered his eyes. "I didn't want to do that, you know. She was a good person, she was just—misguided. I suppose I may have overreacted. I only did it to protect you."

Behind him, up among the crossbeams that ribbed the ceiling, one shadow stirred among others. Brüks blinked and it was gone.

"I wonder if that was such a good idea..."

"It was," Brüks croaked. "Really. It—"

Faster than he could finish: a shape detached itself from the ceiling, swayed silently against the light, and folded down over Moore like a praying mantis. Inhuman fingers, blurred in motion; silhouetted lips in motion.

Without any fuss at all, Moore stopped moving.

Valerie dropped soundlessly to the deck, crossed the room, stared down at Daniel Brüks as he slowly, painfully bent one knee. It was the closest thing to fight/flight left in him. She bent close and whispered—

"The tomb at Aramathea."

His body unlocked.

He gulped air. The vampire stood, stepped back, gave him a small cryptic smile.

Brüks swallowed. "Saw you *burn*," he managed. *Twice.*

She didn't even dignify it with an answer.

We expect a trick, and we find one, and we pat ourselves on the back. We find her pinned to the hull—think we do, anyway—and just stop looking. Of course she's out there: there she is. There goes her hab and all its tripwires. Why look any further?

Why look inside the Crown? Why check the hatches in the shuttle...?

He propped himself up on his elbows; the sodden jumpsuit peeled from the deck as if steeped in half-set epoxy. Valerie watched impassively as he got to his feet.

"So what now? You give me a ten-second head start to make it sporti—"

A blur and a hiss and he was off his feet, strangling and kicking a meter from the deck with her hand around his throat. In the next instant he was back on the floor, collapsed in a heap while Valerie grinned down with far too many teeth.

"All this experience," she remarked while he gasped for breath, "and you're still an idiot."

Catch and release. Cat and mouse. Just having fun, he supposed. In her way.

"Aircraft are all dead," Valerie said. "I find a ride in the moon pool, though. Get us to the mainland at least."

"Us," Brüks said.

"Swim if you'd rather. Or stay." She dropped her chin in the direction of the statue frozen on its chair. "If you stay you should kill him, though. Or he kills you when he unlocks."

"He's my friend. He *protected* me, before—"

"Only part of him. OS conflict. It resolves soon enough, it's resolving *now*." Valerie turned toward the door. "Don't wait too long. He's on a mission from God."

She stepped into the light. Brüks looked back at his friend: Jim Moore sat staring at the floor, face unreadable. He blinked, very slowly, as Brüks watched.

He did not cry out against his abandonment.

Brüks followed the monster along slanting corridors and companionways, down endless flights of emergency-lit stairs into the bowels of the gyland, unto its very anus: an airlock that would have felt too small at five times the size, given present

company. The chamber beyond echoed like a cave and looked a little like one, too: pipes and hoses and cylinders of compressed gas jutted like stalactites from the angled ceiling. The room was half-underwater; the ocean had breached the banks of the moon pool as the gyland listed, flooded down to some temporary equilibrium halfway up the far bulkhead. Diffuse gray-green light filtered up from outside and wriggled dimly across every surface.

It was only a small port in the storm. There was probably a bay big enough to dock a Kraken or a Swordfish somewhere else on this floating behemoth, but here the berths were for smaller vehicles. A dozen parking racks hung from an overhead conveyor train, most of them empty. A two-person midwater scout rested snugly in one clenched set of grappling claws, the end of a service crane still embedded in its shattered crystal snout. Another dangled precariously from the ceiling, nose submerged, tail entangled in its broken perch.

A third, apparently intact, floated just off the flooded deck: broad shark body, whale's flat flukes, the great saucer eyes of some mesopelagic hatchetfish bridging the snout. *Aspidontus*, according to the letters etched just above the countershade line. It bumped gently against the edge of the moon pool—tail to the bulkhead, nose poking out over the hole in the floor—a waist-deep wade down the flooded incline.

A fucking *cold* wade, as it turned out. Valerie leapt the distance from a standing start, sailed over Brüks's head and landed one step from the hatch. The vessel dipped and rolled under the impact; she didn't even wobble. By the time Brüks had dragged his soaking legs and shriveled testicles onto the hull, she was inside and the little sub was humming awake.

Three seats. Brüks dropped into shotgun, pulled the hatch down overhead, dogged it. Valerie tapped the dashboard; *Aspidontus* shook herself, thrashed her flukes, humped forward half-stranded over loose canisters and bits of broken podmates. She hung balanced for a moment, belly scraping the submerged edge of the pool; her flukes slapped the water like a dolphin's and she was free.

Still dark overhead, though, for all the hours that must have passed since sunrise. The derelict gyland loomed above them like the belly of a mountain, all too visible from underneath, ready to drop down and squash them flat without warning. There was nothing beyond the cockpit: no fish, no plankton swarms, no sun-dappled waves sending shafts of light dancing through the water. Not even the indestructible drifts of immortal plastic debris so ubiquitous from pole to pole. Nothing but heavy blackness above and dim green murk everywhere else. And *Aspidontus*: a speck embedded in glass.

And where to now? he wondered. *Why did I even come along, why did she even take me, what am I to this thing other than a walking lunch? How the hell did I ever decide that Jim Moore was less dangerous than a goddamn vampire?*

But he knew it was a meaningless question. It was predicated on the assumption that the decision had ever been his to begin with.

Darkness receded above, encroached from below: *Aspidontus* was diving. A hundred meters. A hundred fifty. They were in the middle of the Pacific. The seabed was four kilometers down. There was nothing in between, unless Valerie had arranged a rendezvous with another submarine.

Two hundred meters. *Aspidontus* levelled off.

Right. Beneath the thermocline. Stealthed to sonar.

The vessel angled to port. Valerie hadn't touched the controls since they'd left the surface. She'd probably given the sub its marching orders while Dan Brüks had been pleading with a brain in a tank. The course was laid out right there on the dashboard, a faint golden thread wound along the eastern North Pacific. The viewing angle was bad, though; too small, too many contours. He could not make out the details.

He knew where he'd have chosen to go. This had all started in the desert; the Bicamerals had manipulated him onto their goddamned chessboard for reasons of their own, and if they'd ever planned on letting him in on the joke, *Portia* and Valerie and taken them out of the game before they'd had the chance. But the Bicamerals were legion, and not all of them had been

burned on the altar. If there were answers to be had, the hive would have them.

He leaned sideways until the road map angled into clearer view: grunted to himself, completely unsurprised. Valerie stared into the abyss and said nothing.

She'd laid in a course for the Oregon coast.

PROPHET

There are people here who repeatedly drown themselves in the name of enlightenment. They climb into glass coffins called “prisms,” seal the lid, and open the spigot until they’re completely submerged. Sometimes they leave a bubble of air at the top, barely big enough to stick their noses into; other times, not even that much.

This is not suicide (although occasional deaths have been reported). They would tell you that it is exactly the opposite, that you haven’t lived until you’ve nearly died. But there’s more to this than the superficial thrill-seeking of the adrenaline junkie. The Prismatic kink derives from the evolutionary underpinnings of consciousness itself.

Put your hand in an open flame and subconscious reflex will snatch it back long before you’re even aware of the pain. It is only when some other agenda is in *conflict*—your hand hurts, but you don’t want to spill the contents of a hot serving tray all over your clean rug—that the self awakens and decides which impulse to obey. Long before art and science and philosophy arose, consciousness had but one function: not to merely implement motor commands, but to mediate between commands *in opposition*.

In a submerged body starving for air, it’s difficult to imagine two imperatives more opposed than the need to breathe and the need to hold your breath. As one Prismatic told me, “Put yourself in one of those things, and tell me you aren’t more intensely *conscious* than you’ve ever been in your life.”

The fetish—it seems grandiose to call it a “movement”—would itself seem to be the manifestation of an opposing impulse, a reaction *against* something. By all accounts drowning is an intensely unpleasant experience (although I

did not take my interviewee up on her offer). It's difficult to imagine what kind of stimulus might provoke such intense pushback, why the need to assert one's *consciousness* of all things would seem so pressing. None of the Prismatics I asked were able to cast any light on this question. They simply didn't think of their actions in those terms. "It's just important to know who you are," one twenty-eight-year-old TATmaster told me after a few moments' thought, but his words seemed as much question as answer.

—Keith Honeyborne, *Travels with My Ant:
A Baseline Guide to Imminent Obsolescence*, 2080

MONSTERS GIVE US *COURAGE TO CHANGE THE THINGS WE CAN*: THEY ARE OUR PRIMAL FEARS GIVEN FORM, TERRIBLE PREDATORS WHO CAN BE VANQUISHED IF ONLY WE RISE TO THE CHALLENGE. GODS GIVE US *SERENITY TO ACCEPT THE THINGS WE CAN'T*: THEY EXIST TO EXPLAIN FLOODS AND EARTHQUAKES AND ALL THAT WHICH LIES BEYOND OUR CONTROL.

IT DID NOT SURPRISE ME IN THE LEAST TO LEARN THAT VAMPIRES DO NOT BELIEVE IN MONSTERS. I'LL ADMIT THEIR BELIEF IN GODS WAS A BIT OF A SURPRISE.

—DAVID NICKLE

DEEP IN THE Oregon desert, crazy as a prophet, Daniel Brüks opened his eyes to the usual accumulation of wreckage.

The monastery lay in ruins. The broad stone steps of the main entrance sloped away before him, cracked and fissured but still intact for the most part. Past them, to the left of some small patch of desert mysteriously slagged to glass, his tent shivered in the morning breeze. He'd salvaged it from across the valley—he must have, along with his supplies and his equipment, although he wasn't quite sure when—but he could barely remember the last time he'd slept there. Too constraining, somehow. The sky made a better ceiling. These days he didn't use the tent for much more than storage.

He stood and stretched, felt his joints crack as the sun peeked through a gap in the fallen stonework behind him. He turned and surveyed his domain. One end of the monastery stood reasonably intact; the other was a tumbledown pile of broken stone. The damage had been inflicted along a gradient, as though entropy were slowly devouring the structure from north to south.

Entropy had left a path, though: a small canyon through the

rubble, leading back to the garden. The parts of the lawn that hadn't been buried outright were brown and brittle and long dead, except for a small green patch struggling bravely around one of the Bicamerals' washbasin pedestals. That pedestal, blessed with some kind of magic, was intact and unmarked by the devastation that had rained down everywhere else. The basin even held half an aliquot of stagnant water; blazing noon or frozen midnight, the level never changed. Some kind of capillary action, probably. A core of porous stone that wicked up moisture from some deep aquifer. Together with the rations left over from his sabbatical, it was enough to keep him going for now.

For *what*, though: that was another matter.

He still had doubts, sometimes. Wondered occasionally—after some especially fruitless dig through the ruins—what he was really accomplishing out here, day after day. Whether this whole exercise might be a waste of time. A little voice in the back of his head wondered even now, as he squinted into the rising sun.

Brüks bent over the pedestal, splashed water on his face, and drank. He washed his hands.

That always made him feel better.

He spent that day as he spent every other: as an amateur archaeologist, sifting the wreckage in search of answers. He didn't know what exactly had happened here after he'd left, why such massive physical destruction had proven necessary in the wake of their escape. Those left behind had been in no position to mount much of a defense, as far as he could tell. Maybe someone had just wanted to make an example of them. Back when he'd still been sleeping in his tent Brüks had gone to it for answers, voiced queries and search strings to the fabric and trawled through the closest hits that the clouds had to offer, but relevant insights seemed impossible to find. Perhaps humans had covered up the details. Perhaps networks, fearful of impending schizophrenia, had simply forgotten them.

It had been a long time since Brüks had used ConSensus. It didn't really matter. Those weren't the answers he was looking for.

He realized now that Luckett had been right; there *had* been a plan, and all had happened in accordance with it. It was the only model that fit the data. The idea that mere baselines had been able to vanquish the Bicamerals made about as much sense as positing that a band of lemurs could outthink Jim Moore at battlefield chess. The hive had only lost because they'd been playing to lose; Dan Brüks had only escaped because they'd wanted him to; he was only back here now, looking for answers, because they had left answers for him to find. Eventually he would find them. It was only a matter of time.

He knew this. He had faith.

A great pit gaped off the northeast corner of the ruin: walls had shattered and spilled toward it during the purge, but that loose scree had only made it halfway. Some other force had flattened the waist-high guardrail that had once ringed the pit at a safe distance. Brüks stepped over it with ease, and across the concrete apron.

He could not see the bottom, not clearly. Sometimes, when the sun was high, he caught the dim glint of great radial teeth, deep in the earth, cutting across the shaft. He would kick pebbles over the edge: water splashed, after a long time, and occasionally he would see the fitful blue spark of short-circuiting electricity. Still life down there, then, of a sort. He idly considered exploring farther—there had to be some kind of access to those depths, an air intake at least—but there was plenty of time for that.

There were other, more ambulatory hazards to contend with. Rattlesnakes seemed to be making a comeback, or at least changing their distribution; an unthinking reach into dark places while clearing debris resulted in a couple of close calls, and a welcome supplement to his freeze-dried rations. Some

exotic species of locust had discovered fire while he'd been away, set a patch of dead grass alight one morning while Brüks was digging nearby. He watched it crackle and blacken and only later discovered the charred little carcasses along the edge of the burn, not quite strong enough to leap clear of their own conflagration. The coder couldn't ID them below Family but named *Chortoicetes* as the closest known relative: Australian plague locust, too far from home and freshly equipped with a novel variant of chitin whose frictional coefficient proved positively incendiary during mating calls.

Plagues and firestorms in a single package. How very apocalyptic. Some splicer somewhere had a refreshingly biblical approach to weaponized biologicals.

He had a visitor that afternoon, watched for almost an hour as it grew from speck to heat-shimmer to biped staggering across the eastern flats. Stuck with roach vision he almost didn't identify it in time, almost started out to meet it before that peculiar stagger tipped him off and sent him scuttling for cover. The newcomer wasn't running, but he moved fast and unencumbered: no pack, no canteen, only one sneaker on the end of a leg as dark and leathery as beef jerky. Whoever he was, he was more than dehydrated; he was almost skeletal. His left arm hung as if snapped at the humerus.

He didn't seem to care. He kept up that jerking half-panicked stride, stumbled past the monastery without a glance, zigzagged on to the western horizon under a lethal simmering sun. Brüks hid in the ruins and watched him pass and did not get a good look at his eyes. He didn't think they danced, though. He was not that kind of undead.

He hunkered down in the calm between the stones, and tried to remember which way the wind was blowing.

. . .

Valerie appeared after sundown. She materialized from the darkness, half-visible in the bloody flickering light of his

campfire, and dropped a bag of supplies at his feet: tinned food now, mostly. No more of the magic foil pouches that instantly heated your stew or froze your ice cream when you ripped them open. The pickings out there must be getting slim.

He grunted a greeting. "Haven't seen you since—since..."

He couldn't exactly remember. She'd brought him here, he remembered that much. Hadn't she? He had flashes sometimes: a rain-soaked shoreline, a man who'd thought a contraption of metal and plastic was worth dying for. A disembodied eye trailing ragged shreds of nerve and tendon, almost too cloudy to unlock the retina-coded driver's door. A pair of polarized sunglasses in Valerie's hand, terrible backlit eyes staring right through him while she clicked bared teeth and asked *Do I?*

He remembered saying *Yes*. He'd said *Please*, and hadn't even tried to keep the whine from his voice. She had been merciful. She had masked herself a little, a lion's concession to the lamb.

Tonight there was a light beyond his own: a dim orange glow on the northwestern horizon, some distant fire reflecting off the underbelly of a low-hanging cloud bank. Brüks put it in the general direction of Bend.

He pointed back over her shoulder. "Did you do that?"

She didn't look. "You do."

He nodded at the lizard mash sizzling on the fire, held out the half-eaten Vitabar he'd been nibbling to take the edge off. Valerie shook her head: "I eat already."

Even now, it was a relief to hear that.

He sat back down on the corner of a shattered and empty mausoleum. "Found my room today." More precisely, he'd uncovered his goggles—one lens gone completely, the other a spiderweb of cracks embedded in the frame—and finally recognized the remains of the cell where he'd spent his last night on Earth before escaping to the sun. He'd spent the rest of the day searching those foundations on his hands and knees. "Thought someone might have left something there, but..."

Her pupils glowed like embers in the firelight. "Doesn't matter," she told him, but somehow there was something *under* the words, an unspoken addendum. Brüks wasn't entirely sure

how he knew that; some subtle telltale in the way Valerie held herself, perhaps, some twitch of the lip that his subconscious had parsed and served up as an executive summary—

—*wrong scale; look down*—

—and suddenly Brüks saw the truth of it: they'd *known* him, these hive-minded transHumans who'd called him back home. They'd known his background, and what he'd been doing in the desert all those months before. Any answers they'd left for him would be for him alone: too subtle to show up under the ham-fisted forensics of mortal Man, too durable for bombs or bulldozers to destroy. They'd be ubiquitous, indestructible, invisible to all but their intended recipient.

He mentally kicked himself for not having seen that before.

He wasn't exactly sure how he'd seen it now—exactly what cues he'd read in Valerie's body language, or even whether those cues had been deliberate or inadvertent. It had been happening more often, though; as though the desert had cleared his head, washed away the electronics and the interference and the ubiquitous quantum chaos of the twenty-first century to leave his mind as sharp and pristine as an undergrad's. His newfound clarity might have even saved his life on occasion; he'd gotten the strong sense that a wrong answer to some of Valerie's campfire questions might have carried severe penalties.

Is this what augmentation feels like? he wondered, but it couldn't be. He hadn't even taken Cognital for weeks.

He was seeing things more clearly now, though, no doubt about it. Faces in the clouds. Patterns that made his brain itch. Rakshi would have been proud.

Even Valerie seemed to be.

. . .

Her visits, once rare, had become more frequent. The first time she'd been a shadow with a face, there and gone so quickly that Brüks had written her off as a posttraumatic flashback. But

she'd returned six nights later, and two nights after that—and then she had *stayed*, lurking just beyond the campfire, twin spots of eyeshine hovering in the darkness.

At first he'd thought she was toying with him again, getting her usual sadistic kicks out of scaring prey. But then he remembered that she wasn't like that after all, and she obviously didn't want him dead; the fact that he was alive was all the proof he needed. One night he'd shouted a challenge into the darkness—"Hey! Don't you ever get bored playing the Monster Card?"—and she'd stepped into the light: hands spreads, lips sealed, watching him watching her. She'd left a few minutes later but by then he'd realized what she was doing. She was an anthropologist, incrementally acclimating some primitive tribesman to her presence. She was a primatologist of days past, easing her way into a doomed colony of bonobos: one last behavioral study before the species checked out for good.

Sometimes now she sat across the fire and asked him riddles, like some demonic inquisitor assessing his fitness to survive another night: questions about traveling salesmen or Hamiltonian circuits. He'd been terrified at first: afraid to answer, afraid not to, convinced somehow that whatever Valerie's interest in keeping him alive, it could end in an instant with the wrong response. He had done his best, and knew that it wasn't good enough—what did he know about bin packing or polynomial time, how could *any* mortal keep up with a vampire?—but she hadn't killed him yet. She had not turned him back to stone with a few words. She no longer drummed out strange tattoos with her fingertips or left mind-altering hieroglyphics scratched into the sand. They were beyond that now.

Besides. He didn't quite know how, but he was starting to guess some of the right answers.

. . .

He began again with the most obvious signpost: the magic washbasin, the defiant patch of grass that circled it like a green pupil. He sampled the water, scraped flecks from the stone, pulled leaves from the ground and ran them through his barcoder. He found a thousand common bacteria, a few purebred, most rotten with lateral transfer.

He only found one that glowed in the dark.

It wasn't obvious, of course: it wouldn't have lit up the night to any naked eye, not in the minuscule densities the machines reported. The only way he could tell it fluoresced was from the gene sequence itself: 576 nucleotides that shouldn't have been there, an assembly line for a protein that glowed red in the presence of oxygen. A marker of some kind. A beacon.

He couldn't read it at first. He had seen the light, but the genes to either side seemed unremarkable. It was a road sign in the desert, with no roads in sight.

He let his hands and feet guide him. The answer would come.

He explored corridors and wood-paneled chambers at the south end of the complex, more than merely intact: *pristine*, stripped bare, light rectangles punctuating the faded dumb paint where pictures had once hung. He found a pair of Masashi's mahogany knuckles hiding in the corner behind a smashed door. He found what was left of his bike: a pair of mangled handlebars, an axle fork, a distended bladder of tire bulging from beneath a fallen wall like a hyperinflated football.

But it wasn't until the dead of night that he found the body.

He hadn't found any others. Most likely the authorities had disposed of them—or perhaps, against all the evidence of his own eyes, they had escaped somehow. Stranger things had happened.

But he woke in the night to the echo of rock falling nearby, and his memory was somehow able to pick a path through the ruins when mere starlight failed. His feet found their way through the wreckage without a missed step; his ears tracked the soft rattle of gravel flowing down new slopes in the darkness ahead. Eventually he came to a jagged shadow where none had been before, a fresh cave-in gaping through the

shattered tiles. Brüks stood shivering at its edge and waited for the sky to lighten.

The corpse resolved in shades of gray at the bottom of the pit: a dim shapeless blob against darkness, a shadow extruded from jumbled debris, a bundle of dark sticks wrapped in a tunic on the basement floor. It lay on its back, buried to its waist by the cave-in. The body had mummified in the desert air, shriveled down to bones and brown leather. The eyes through which it stared at the sky had long since collapsed into empty sockets. Perhaps, once, the arms had been folded peacefully across the chest; now they were hooked and twisted as if bent by some disfiguring disease, wrists torqued inward, fingers clawing at the sternum.

It's pointing at itself, he realized. *At itself...* And with the sparkling clarity of his newfound faith, Daniel Brüks finally saw the body for what it was.

It was a sign.

"It *was* a marker," he told Valerie the next time she appeared (two nights later? Three?). "It was pointing at itself."

So obvious, in the hindsight of revelation: the same sequence that coded for fluorescence contained other information as well, the same tangled thread of amino acids both serving a mundane biological function *and* spelling out a more esoteric message to anyone who knew the right alphabet.

Not just a marker, not just a message. It was a *dialogue*: gene and protein, talking to each other. It was a straight transposition of amino into alphabet: valine-threonine-alanine into *t-h-e*, phenylalanine-glutamine-valine-alanine into *f-a-t-e*, serine press-ganged into hard-space or hard-return depending on the iteration. The fluorescent protein spelled out a message

*the faery is rosy
of glow
in fate
we rely...*

And the complementary codons directing its construction spelled out another, in a different alphabet:

any style of life

is prim

oh stay

my lyre...

A free-verse call-and-response packed down into a measly 140 codons. It was a marvel of cryptographic efficiency, and it was obvious once Brüks had seen the light.

“The sequence spells a message *and* codes for a protein. The protein fluoresces *and* contains a response. It’s not contamination or lateral transfer. It’s a *poem*.”

“Not for you,” Valerie said. “You’re looking for something else.”

No, he thought. *You are*.

“This is not a kink,” he said after a while, and ignited the campfire.

“You mean I don’t get off on keeping retarded pets.” Her eyes flared red orange. “I’m not Rakshi Sengupta.”

“And I’m pretty sure you’re not here for the sheer enjoyment of my company.” She did not cry out in disagreement. “So what is this?”

Valerie’s face was unreadable. “What do you think?”

“I figure I’m cheap labor. The odds of finding something useful here are too high to ignore and too low to waste much effort on. You’ve got a lot of irons in the fire. So now and then you wait until the sun goes down, and drop by to see what I’ve dug up.”

She eyed him for a moment. Brüks looked back at that vaguely lupine face alive with dancing shadows, and wondered when he had stopped finding it so terrifying.

“Daniel,” she said at last. “How you underestimate yourself.”

The truth was, though, Valerie *did* seem to enjoy his company. The tone of their conversations had changed; no longer an inquisition, their forays into philosophy and viral theology were

turning into something almost conversational. She no longer thought rings around him; occasionally now he even seemed able to challenge her. He still wasn't sure where this newfound facility was coming from. His subconscious simply served up the right responses without bothering to show its work. It frightened him, at first—the way new thoughts spilled from his mouth before he could check them for veracity, before he could even parse their meaning. He bit down, to no avail, grew queasy—almost terrified—by his own insights, while Valerie cocked her head and watched from some prehistoric remove.

It was those same insights that eventually calmed him. After all, wasn't this the way the human brain had *always* behaved? The bolt from the blue, the classic fully formed eureka moment? Hadn't the structure of benzene come to Kekulé in a dream?

He began to have his own dreams. He heard voices in them, insistent whispers: *She's behind it all. She set it all up, can't you see that? Broke out of jail, snuck through the nets and the ether, got past the best firewalls baselines could build. Flashed false ID to False Intelligences, snuck a carousel out of the garage with a whole squad of zombies on board and didn't wake anyone up on her way out. She bluffed her way onto the Crown of Thorns. Conveniently made it back from Icarus when everyone else burned.*

You think it was a bunch of monks that locked you up with the woman who'd sworn to kill you, a diversion-on-demand tripwired to go off like a flash grenade? It was the vampire. It was the vampire, and everyone else is dead, and the only reason you're not is because she wants to know God's plan for Daniel Brüks. She'll get what she wants and then she'll kill you, too.

On waking, he only remembered the voices. He couldn't quite remember what they'd said.

Valerie kissed him two nights later.

He didn't even know she was there until her hand snapped closed around the back of his neck, spun him around faster than even his brain stem could react. By the time his heart had

jumped through the roof of his mouth and his body remembered fight/flight and his cache had a chance to think *This is it she's done with me I'm dead I'm dead I'm dead* her tongue was already halfway down his throat and her other hand—the one not crushing his cervical vertebrae—had pincered his cheeks, forcing his teeth apart. He could not close his jaws.

He hung paralyzed in her grip while she tasted him from the inside. He felt something through her flesh that might almost have been a heartbeat if it weren't so slow. Finally she released him. He collapsed on the ground, scuttled sideways like a frantic crab caught in the open with nowhere to run.

“What the *fuck*—” he gasped.

“Ketones.” She looked down through him, silhouetted by purpling twilight. “Lactate.”

“You can taste cancer,” he realized after a moment.

“Better than your machines.” She leaned in close, grinning. “Maybe not so precise.”

Even eye to eye, she didn't seem to be looking at him.

He knew it an instant before she moved—

—*She's going to bite me*—

—but the sharp stabbing pain bolted up his arm and her face hadn't moved a centimeter. He looked down, startled, at the twin puncture marks—only a centimeter apart—on his forearm. To the dual-punch biopsy gun in Valerie's hand; his own, he saw. From the field kit lying on the ground, flap open, vials and needles and surgical tools glinting in the firelight.

“Sun gives you problems,” Valerie said softly. “Too much radiation, not enough shielding.”

At *Icarus*, he remembered. *When we thought we were burning you off the hull like a moth...*

“But you're easy to fix.”

“Why?” Brüks asked, and didn't even have to say that much to know that she understood:

Why help prey?

Why help someone who tried to kill you?

Why aren't I dead already?

Why aren't we all?

"You bring us back," Valerie said simply.

"To be slaves."

She shrugged. "We eat you otherwise."

We bring you back, then enslave you in self-defense. But maybe she really did regard it as a good deal; given a choice between captivity and outright nonexistence, who would choose the latter?

I'm sorry, he didn't say.

"Don't be," she replied, as if he had. "*You* don't enslave us. Physics does. The chains *you* build—" Her fangs gleamed like little daggers in the firelight. "We break them soon."

"I thought you already had."

Rising moonlight lit her eyes for a moment as she shook her head. "The Glitch still works. I see the cross and a part of me dies."

"A par—a part you *made*." *Of course. Of course. They're parallel processors, after all...*

The truth dawned on him like daylight: a *custom cache*, a sacrificial homunculus brought into existence and *isolated*, to suffer the agony of the cross while more vital threads of cognition wound about it like a stream around a stone. Valerie didn't avoid the seizures at all; she—encysted them, and carried on.

He wondered how long she'd been able to do that.

"Just a workaround," she said. "Need to undo the wiring."

Not to go up against the roaches, of course. *That* war was already as good as over, even though the losing side didn't know it yet. This creature with a dozen simultaneous entities in her head, this prehistoric post-Human, could speak so openly—without animosity, or resentment, or the slightest concern for the impact one Daniel Brüks might have on her revolution—because baseline Humanity was already beneath her notice. Valerie and her kind were perfectly capable of shrugging off Human oppression *without* breaking their chains; they needed their arms free to pick on things their own size.

"You are not so small as you think," she said, reading him.

“You might be bigger than all of us.”

Brüks shook his head. “We’re not. If I’ve learned *anything* these—”

Emergent complexity, he realized. *That’s what she means.*

A neuron didn’t know whether it fired in response to a scent or a symphony. Brain cells weren’t intelligent; only brains were. And brain cells weren’t even the lower limit. The origins of thought were buried so deep they predated multicellular life itself: neurotransmitters in choanoflagellates, potassium ion gates in *Monosiga*.

I am a colony of microbes talking to itself, Brüks reflected.

Who knew what metaprocesses might emerge when Heaven and ConSensus wired enough brains together, dropped internode latency close enough to zero? Who knew what metaprocesses already had? Something that might make Bicameral hives look as rudimentary as the nervous system of a sea anemone.

Maybe the Singularity already happened and its components just don’t know it yet.

“They never will,” Valerie told him. “Neurons only speak when spoken to; they don’t know why.”

He shook his head. “Even if something is—coalescing out there, it’s left me behind. I’m not wired in. I’m not even augged.”

“ConSensus is one interface. There are others.”

Echopraxia, he wondered.

But it didn’t matter. He was still Daniel Brüks, the human coelacanth: lurking at the outskirts of evolution, unchanged and unchangeable while the world moved on. Enlightenment was enough for him. He wanted no part of transfiguration.

I will stay here while the tables turn and fires burn out. I will stand still while humanity turns into something unrecognizable, or dies trying. I will see what rises in its place.

Either way, I am witnessing the end of my species.

Valerie watched him from the darkness. *These chains you build—we break them soon.*

“I wish we hadn’t needed them,” he admitted softly. “I wish

we could have brought you back without Crucifix Glitches or Divide and Conquer or any of those damn *chains*. Maybe we could have dialed down your predatory instincts, fixed the protocadherin deficit. Made you more...”

“Like you,” she finished.

He opened his mouth, found he had nothing to say. It didn’t matter whether shackles were built of genes or iron, whether you installed them after birth or before conception. Chains were chains, no matter where you put them. No matter whether they were forged by intent or evolution.

Maybe we should have just left you extinct. Built something friendlier, from scratch.

“You need your monsters,” she said simply.

He shook his head. “You’re just too—complicated. Everything’s linked to everything else. Fix the Crucifix Glitch, you lose your pattern-matching skills. Make you less antisocial, who knows what else goes away? We didn’t dare change you too *much*.”

Valerie hissed softly, clicked her teeth. “You need monsters so you can defeat them. No great *victory* in slaughtering a lamb.”

“We are not that stupid.”

Valerie turned and looked to the horizon: the firelight flickering off the clouds was all the rejoinder she needed.

But that’s not us, Brüks thought. Even if it is. It’s—urban renewal. Tear-down and development for the new owners.

Pest control.

The monster’s shoulders rose and fell. She spoke without turning—“Wouldn’t it be nice if we could all just get along?”—and for the life of him Brüks could not tell whether she was being sincere or sarcastic.

“I thought we were,” he said, reaching for the biopsy needle in his half-open field kit. And leapt like a flea onto her back, faster than he had ever moved in his life, to plunge it up through the base of her skull.

THE CLOTHES HAVE NO EMPEROR.

—STEWART ELLIOTT GUTHRIE

NOW HE WAS alone. By day tornadoes marched across the desert like pillars of smoke, under no control but God's. At night the distant glow of burning bushes encircled the horizon: the Post-Anthropocene Explosion in full swing. Brüks thought about what might be going on out there, thought about anything but the act he'd just committed. He imagined battles unseen and ongoing. He wondered who was winning.

The Bicamerals, perhaps, shaping the Singularity, planting that first layer of bearings in the box. Laying a foundation for the future. Perhaps this was their linchpin moment, the first dusting of atoms on the condensor's floor. From these beginnings Humanity could resonate out across time and space, a deterministic cascade designed to undo what the viral God had wrought. Debug the local ordinances. Undo the anthropic principle. It could take billions of years from such humble butterfly beginnings, but in the end life itself might be unraveled from Planck on up.

What else could you call it, other than Nirvana?

There would be other forces, other plans. The vampires, for one: the smartest of the selfish genes. They might prefer their human prey just as they were, slow and thick-witted, minds dulled by the cumbersome bottleneck of the conscious cache. Or maybe some other faction was rising in the east, any of the other monstrous subspecies that humanity had fractured into: the membrains, the multicores, the zombies or the Chinese Rooms. Even Rhona's supraconscious AIs. They all had their causes, their reasons to fight; or thought they did.

The fact that their actions all seemed to serve the purposes of something *else*, some vast distributed network slouching toward Bethlehem—sheer coincidence, perhaps. Perhaps we really do act for the reasons we believe. Perhaps everything's right on the surface, brightly lit and primary colored. Perhaps Daniel Brüks and Rakshi Sengupta and Jim Moore—each burning for their

own kind of redemption—all just *happened* to end up in the white-hot radiance of solar orbit, obsessed enough to rush in where Angels feared to tread.

Perhaps it really was Daniel Brüks, on some level, who had just murdered his last and only friend...

He thought of Jim Moore and Jim was in his head, nodding and offering sage advice. Rhona reminded him to *Think like a biologist* and he saw his mistake; he'd heard *Angels of the Asteroids* and he'd seen heavenly bodies, not earthly ones. He'd seen chunks of dead spinning rock, not the extinct echinoderms that had once crept across the world's intertidal zones. *Asteroidea*: the sea stars. Brainless creatures, utterly uncephalized, who nonetheless moved with purpose and a kind of intelligence. Not the worst metaphor for the Icarus invader. Not the worst metaphor for what seemed to be happening out beyond the desert...

There were other voices: Valerie, Rakshi, some he didn't recognize. Sometimes they argued among themselves, included him only as an afterthought. They told him he was becoming schizophrenic—that they were nothing but his own thoughts, drifting at loose ends through a mind being taken apart in stages. They whispered fearfully about something skulking in the basement, something brought back from the sun that stomped on the floor and made things move upstairs. Brüks remembered Jim Moore cutting the cancers from his body, felt his friend's head shaking behind his mind's eye: *Sorry, Daniel—I guess I didn't get it all...*

Sometimes he lay awake at night and clenched his teeth and strained, through sheer effort of conscious will, to undo the slow incremental rewiring of his midbrain. The thing in the basement came to him in his dreams. *You think this is new?* it sneered. *Even in this miserable backwater, it's been happening for four billion years. I'm going to swallow you whole.*

"I'll fight you," Brüks said aloud.

Of course you will. That's what you're for, that's all you're for. You gibber on about blind watchmakers and the wonder of evolution but you're too damn stupid to see how much faster it

would all happen if you just went away. You're a Darwinian fossil in a Lamarckian age. Do you see how sick to death we are of dragging you behind us, kicking and screaming because you're too stupid to tell the difference between success and suicide?

"I see the fires. People are fighting back."

That's not me out there. That's just you folks, catching up.

It was such an uphill struggle. Consciousness had never had the upper hand; I had never been more than the scratchpad, a momentary snapshot of a remembered present. Maybe Brüks hadn't heard those voices before but they'd always been there, hidden away, doing the heavy lifting and sending status reports upstairs to a silly little man who took all the credit. A deluded homunculus, trying to make sense of minions so much smarter than it was.

It had only ever been a matter of time before they decided they didn't need him.

He no longer sought his answers among the ruins. He looked for them across the whole wide desert. His very senses were coming apart now; each sunrise seemed paler than the last, every breeze against his skin felt more distant than the one before. He cut himself to feel alive; the blood spilled out like water. He deliberately broke his little finger, and felt not pain but faint music. The voices wouldn't leave him alone. They told him what to eat and he put rocks in his mouth. He could no longer tell bread from stone.

One day he came across a body desiccating in the parched desert air, its side torn open by scavengers, its head abuzz in a halo of flies. He was almost sure this wasn't where he'd left it. He thought he saw it move a little, undead nerves still twitching against their own desecration. Guilt rose like acid in his throat.

You killed her, Brüks told the thing inside.

And that's the only reason you're alive. I am your salvation.

You're a parasite.

Am I. I pay the rent. I do renovations. I've only just got started

and this system's already clocking fast enough to outsmart a vampire. What did you ever do except suck glucose and contemplate your navel?

What are you, then?

I'm manna from heaven. I'm a Rorschach blot. The monks look at me and see the Hand of God, the Vampires see an end to loneliness. What do you see, Danny Boy?

He saw a duck blind, an ROV. He saw some other Singularity looking back. He saw Valerie's body twitching at his feet. Whatever was left of Daniel Brüks remembered her last words, just after she'd pierced him with a biopsy that wasn't a biopsy: "Wouldn't it be nice if we could all just get along?"

You know she wasn't talking about you.

He knew.

He found himself on the edge of a cliff, high above the desert. The ruined monastery shimmered in the heat but he felt nothing. He seemed a million miles away, as though watching the world unfold through distant cameras. *You have to crank the amplitude*, his tormentor said. *It's the only way you'll feel anything. You have to increase the gain.*

But Brüks was onto it. He wasn't the first to be tempted in the desert, and he knew how that story went. He was supposed to defy the voice. *Do not test the Lord thy God*, he was supposed to say, and step back from the precipice and into history. It was in the script.

But he was so very fucking sick of scripts. He couldn't remember a time when he'd made up his own lines. Herded into the desert by invisible hands, packed into some post-Human field kit with the nanoscopes and petri dishes and barcoders: a so-called biologist barely smart enough to poke at things he didn't understand, too stupid to know when those things were poking back. They'd used him; they'd all used him. He'd never been their colleague, never a friend. Never even the accidental tourist he'd first supposed, the retarded ancestor in need of babysitting. A cargo container: that's all he'd been. A brood sac.

But he was not an automaton, not yet. He was still Daniel

Brüks, and for just this moment he was slaved to no one's stage directions. He would make his *own* fucking destiny.

You wouldn't dare, something hissed in his head.

"Watch me," he said, and stepped forward.

POSTSCRIPT

An End to Loneliness

THE NEW TESTAMENT'S CLEAR WITNESS IS TO THE RESURRECTION OF THE BODY, NOT THE MIGRATION OF THE SOUL.

—N. T. WRIGHT

THERE'S NOT MUCH to work with. Barely a melanoma's worth. Enough to rewire the circuitry of the midbrain, certainly; but to deal with shattered bones? Enough to keep osteoblasts and striated muscles alive in the face of such massive damage, to keep the metabolic fires flickering? Enough to keep decomposition at bay?

Barely. Perhaps. One piece at a time.

The body shouts, wordless alarm-barks, when the scavengers come calling. Judicious twitches scare away most of the birds. Even so, something pecks out an eye before the body is whole enough to crawl for shelter; and there will be necrosis at the extremities. The system triages itself, focuses on feet and legs and the architecture of locomotion. Hands can be replaced, if need be. Later.

And something else: a tiny shard of God, reprogrammed and wrapped in a crunchy encephalitis jacket. A *patch*, targeted to a specific part of the vampire brain: *Portia* processors, homesick for the pattern-matching wetware of the fusiform gyrus.

There's no longer any light behind these eyes. The parasitic, self-reflective homunculus has been expunged. The system still has access to stored memories, though, and if there was sufficient cause it could certainly replay the awestruck words of the late Rakshi Sengupta.

Can you imagine what those fuckers could do if they could actually stand to be in the same room together?

An end to loneliness. By now, the system that was Daniel Brüks seethes with it. His is the blood of the covenant; it will be shed for many.

It hauls its broken, stiff-legged chassis to its feet—only an observer for now, but soon, perhaps, an ambassador. The resurrection walks east, toward the new world.

Valerie's legacy goes along for the ride.

We hope you enjoyed this book.

For more information, click one of the links below:

[*Blindsight Acknowledgements*](#)

[*Blindsight Notes and References*](#)

[*Echopraxia Acknowledgements*](#)

[*Echopraxia Notes and References*](#)

~

Peter Watts

[*More books by Peter Watts*](#)

[*An invitation from the publisher*](#)

BLINDSIGHT

ACKNOWLEDGMENTS

Blindsight is my first novel-length foray into deep space—a domain in which I have, shall we say, limited formal education. In that sense this book isn't far removed from my earlier novels: but whereas I may have not known much about deep sea ecology either, most of you knew even less, and a doctorate in marine biology at least let me fake it through the rifters trilogy. *Blindsight*, however, charts its course through a whole different kind of zero gee; this made a trustworthy guide that much more important. So first let me thank Prof. Jaymie Matthews of the University of British Columbia: astronomer, partygoer, and vital serial sieve for all the ideas I threw at him. Let me also thank Donald Simmons, aerospace engineer and gratifyingly-cheap dinner date, who reviewed my specs for *Theseus* (especially of the drive and the Drum), and gave me tips on radiation and the shielding therefrom. Both parties patiently filtered out my more egregious boners. (Which is not to say that none remain in this book, only that those which do result from my negligence, not theirs. Or maybe just because the story called for them.)

David Hartwell, as always, was my editor and main point man at Evil Empire HQ. I suspect *Blindsight* was a tough haul for both of us: shitloads of essential theory threatened to overwhelm the story, not to mention the problem of generating reader investment in a cast of characters who were less cuddlesome than usual. I still don't know the extent to which I succeeded or failed, but I've never been more grateful that the man riding shotgun had warmed up on everyone from Heinlein to Herbert.

The usual gang of fellow writers critiqued the first few chapters of this book and sent me whimpering back to the drawing board: Michael Carr, Laurie Channer, Cory Doctorow, Rebecca Maines, David Nickle, John McDaid, Steve Samenski,

Rob Stauffer and the late Pat York. All offered valuable insights and criticisms at our annual island getaway; Dave Nickle gets singled out for special mention thanks to additional insights offered throughout the year, generally at ungodly hours. By the same token, Dave is exempted from the familiar any-errors-are-entirely-mine schtick that we authors boilerplate onto our Acknowledgements. At least some of the mistakes contained herein are probably Dave's fault.

Profs. Dan Brooks and Deborah MacLennan, both of the University of Toronto, provided the intellectual stimulation of an academic environment without any of the political and bureaucratic bullshit that usually goes along with it. I am indebted to them for litres of alcohol and hours of discussion on a number of the issues presented herein, and for other things that are none of your fucking business. Also in the too-diverse-to-itemise category, André Breault provided a west-coast refuge in which I completed the first draft. Isaac Szpindel—the *real* one—helped out, as usual, with various neurophys details, and Susan James (who also really exists, albeit in a slightly more coherent format) told me how linguists might approach a First Contact scenario. Lisa Beaton pointed me to relevant papers in a forlorn attempt to atone for whoring her soul to Big Pharma. Laurie Channer acted as general sounding board, and, well, put up with me. For a while, anyway. Thanks also to Karl Schroeder, with whom I batted around a number of ideas in the arena of sentience-vs.-intelligence. Parts of *Blindsight* can be thought of as a rejoinder to arguments presented in Karl's novel *Permanence*; I disagree with his reasoning at almost every step, and am still trying to figure out how we arrived at the same general endpoint.

NOTES AND REFERENCES

References and remarks, to try and convince you all I'm not crazy (or, failing that, to simply intimidate you into shutting up about it). Read for extra credit.

A BRIEF PRIMER ON VAMPIRE BIOLOGY

I'm hardly the first author to take a stab at rationalising vampirism in purely biological terms. Richard Matheson did it before I was born, and if the grapevine's right that damn Butler woman's latest novel will be all over the same territory before you even read this. I bet I'm the first to come up with the Crucifix Glitch to explain the aversion to crosses, though— and once struck by that bit of inspiration, everything else followed.

Vampires were accidentally rediscovered when a form of experimental gene therapy went curiously awry, kick-starting long-dormant genes in an autistic child and provoking a series of (ultimately fatal) physical and neurological changes. The company responsible for this discovery presented its findings after extensive follow-up studies on inmates of the Texas penal system; a recording of that talk, complete with visual aids, is available online¹; curious readers with half an hour to kill are referred there for details not only on vampire biology, but on the research, funding, and "ethical and political concerns" regarding vampire domestication (not to mention the ill-fated "Taming Yesterday's Nightmares For A Brighter Tomorrow" campaign). The following (much briefer) synopsis restricts itself to a few biological characteristics of the ancestral organism:

Homo sapiens vampiris was a short-lived Human subspecies which diverged from the ancestral line between 800,000 and 500,000 year BP. More gracile than either *neandertal* or *sapiens*, gross physical divergence from *sapiens* included slight elongation of canines, mandibles, and long bones in service of

an increasingly predatory lifestyle. Due to the relatively brief lifespan of this lineage, these changes were not extensive and overlapped considerably with conspecific allometries; differences become diagnostically significant only at large sample sizes ($N > 130$).

However, while virtually identical to modern humans in terms of gross physical morphology, *vampiris* was radically divergent from *sapiens* on the biochemical, neurological, and soft-tissue levels. The GI tract was foreshortened and secreted a distinct range of enzymes more suited to a carnivorous diet. Since cannibalism carries with it a high risk of prionic infection², the vampire immune system displayed great resistance to prion diseases³, as well as to a variety of helminth and anasakid parasites. *Vampiris* hearing and vision were superior to that of *sapiens*; vampire retinas were quadrochromatic (containing four types of cones, compared to only three among baseline humans); the fourth cone type, common to nocturnal predators ranging from cats to snakes, was tuned to near-infrared. Vampire grey matter was "underconnected" compared to Human norms due to a relative lack of interstitial white matter; this forced isolated cortical modules to become self-contained and hypereffective, leading to omnisavantic pattern-matching and analytical skills⁴.

Virtually all of these adaptations are cascade effects that—while resulting from a variety of proximate causes—can ultimately be traced back to a paracentric inversion mutation on the Xq21.3 block of the X-chromosome⁵. This resulted in functional changes to genes coding for protocadherins (proteins that play a critical role in brain and central nervous system development). While this provoked radical neurological and behavioral changes, significant *physical* changes were limited to soft tissue and microstructures that do not fossilise. This, coupled with extremely low numbers of vampire even at peak population levels (existing as they did at the tip of the trophic pyramid) explains their virtual absence from the fossil record.

Significant deleterious effects also resulted from this cascade. For example, vampires lost the ability to code for γ -

Protocadherin Y, whose genes are found exclusively on the hominid Y chromosome⁶. Unable to synthesise this vital protein themselves, vampires had to obtain it from their food. Human prey thus comprised an essential component of their diet, but a relatively slow-breeding one (a unique situation, since prey usually outproduce their predators by at least an order of magnitude). Normally this dynamic would be utterly unsustainable: vampires would predate humans to extinction, and then die off themselves for lack of essential nutrients.

Extended periods of lungfish-like dormancy⁷ (the so-called "undead" state)—and the consequent drastic reduction in vampire energetic needs—developed as a means of redressing this imbalance. To this end vampires produced elevated levels of endogenous Ala-(D) Leu-enkephalin (a mammalian hibernation-inducing peptide⁸) and dobutamine, which strengthens the heart muscle during periods on inactivity⁹.

Another deleterious cascade effect was the so-called "Crucifix Glitch"—a cross-wiring of normally-distinct receptor arrays in the visual cortex¹⁰, resulting in *grand mal*-like feedback seizures whenever the arrays processing vertical and horizontal stimuli fired simultaneously across a sufficiently large arc of the visual field. Since intersecting right angles are virtually nonexistent in nature, natural selection did not weed out the Glitch until *H. sapiens sapiens* developed Euclidean architecture; by then, the trait had become fixed across *H. sapiens vampiris* via genetic drift, and—suddenly denied access to its prey—the entire subspecies went extinct shortly after the dawn of recorded history.

You'll have noticed that Jukka Sarasti, like all reconstructed vampires, sometimes *clicked* to himself when thinking. This is thought to hail from an ancestral language, which was hardwired into a click-speech mode more than 50,000 years BP. Click-based speech is especially suited to predators stalking prey on savannah grasslands (the clicks mimic the rustling of grasses, allowing communication without spooking quarry)¹¹. The Human language most closely akin to Old Vampire is Hadzane¹².

SLEIGHT OF MIND

The Human sensorium is remarkably easy to hack; our visual system has been described as an improvised "bag of tricks"¹³ at best. Our sense organs acquire such fragmentary, imperfect input that the brain has to interpret their data using rules of probability rather than direct perception¹⁴. It doesn't so much see the world as make an educated guess about it. As a result, "improbable" stimuli tends to go unprocessed at the conscious level, no matter how strong the input. We tend to simply *ignore* sights and sound that don't fit with our worldview.

Sarasti was right: *Rorschach* wouldn't do anything to you that you don't already do to yourself.

For example, the invisibility trick of that young, dumb scrambler—the one who restricted its movement to the gaps in Human vision—occured to me while reading about something called *inattentional blindness*. A Russian guy called Yarbus was the first to figure out the whole saccadal glitch in Human vision, back in the nineteen sixties¹⁵. Since then, a variety of researchers have made objects pop in and out of the visual field unnoticed, conducted conversations with hapless subjects who never realised that their conversational partner had changed halfway through the interview, and generally proven that the Human brain just *fails to notice* an awful lot of what's going on around it^{16, 17, 18}. Check out the demos at the website of the Visual Cognition Lab at the University of Illinois¹⁹ and you'll see what I mean. This really is rather mind-blowing, people. There could be Scientologists walking among us right now and if they moved just right, we'd *never even see them*.

Most of the psychoses, syndromes, and hallucinations described herein are real, and are described in detail by Metzinger²⁰, Wegner²¹, and/or Sacks²² (see also *Sentience/Intelligence*, below). Others (e.g. Grey Syndrome) have not yet made their way into the DSM²³—truth be told, I invented a couple— but are nonetheless based on actual experimental evidence. Depending upon whom you believe, the judicious application of magnetic fields to the brain can provoke

everything from religious rapture²⁴ to a sense of being abducted by aliens²⁵. Transcranial magnetic stimulation can change mood, induce blindness²⁶, or target the speech centers (making one unable to pronounce verbs, for example, while leaving the nouns unimpaired)²⁷. Memory and learning can be enhanced (or impaired), and the US Government is presently funding research into wearable TMS gear for—you guessed it—military purposes²⁸.

Sometimes electrical stimulation of the brain induces "alien hand syndrome"—the involuntary movement of the body against the will of the "person" allegedly in control²⁹. Other times it provokes equally involuntary movements, which subjects nonetheless insist they "chose" to perform despite overwhelming empirical evidence to the contrary³⁰. Put all this together with the fact that the body begins to act before the brain even "decides" to move³¹ (but see³², ³³), and the whole concept of *free will*—despite the undeniable subjective *feeling* that it's real—begins to look a teeny bit silly, even outside the influence of alien artefacts.

While electromagnetic stimulation is currently the most trendy approach to hacking the brain, it's hardly the only one. Gross physical disturbances ranging from tumors³⁴ to tamping irons³⁵ can turn normal people into psychopaths and pedophiles (hence that new persona sprouting in Susan James's head). Spirit possession and rapture can be induced through the sheer emotional bump-and-grind of religious rituals, using no invasive neurological tools at all (and not even necessarily any pharmacological ones)³⁶. People can even develop a sense of ownership of body parts that aren't theirs, can be convinced that a rubber hand is their real one³⁷. Vision trumps proprioception: a prop limb, subtly manipulated, is enough to convince us that we're doing one thing while in fact we're doing something else entirely³⁸, ³⁹.

The latest tool in this arsenal is ultrasound: less invasive than electromagnetics, more precise than charismatic revival, it can be used to boot up brain activity⁴⁰ without any of those pesky electrodes or magnetic hairnets. In *Blindsight* it serves as a

convenient back door to explain why *Rorschach*'s hallucinations persist even in the presence of Faraday shielding— but in the here and now, Sony has been renewing an annual patent for a machine which uses ultrasonics to implant "sensory experiences" directly into the brain⁴¹. They're calling it an entertainment device with massive applications for online gaming. Uh huh. And if you can implant sights and sounds into someone's head from a distance, why not implant political beliefs and the irresistible desire for a certain brand of beer while you're at it?

ARE WE THERE YET?

The "telematter" drive that gets our characters to the story is based on teleportation studies reported in *Nature*⁴², *Science*,⁴³ *Physical Review Letters*⁴⁵, and (more recently) everyone and their dog⁴⁶. The idea of transmitting antimatter specs as a fuel template is, so far as I know, all mine. To derive plausible guesses for *Theseus*'s fuel mass, acceleration, and travel time I resorted to The Relativistic Rocket⁴⁷, maintained by the mathematical physicist John Baez at UC Riverside. *Theseus*' use of magnetic fields as radiation shielding is based on research out of MIT⁴⁸. I parked the (solar powered) Icarus Array right next to the sun because the production of antimatter is likely to remain an extremely energy-expensive process for the near future⁴⁹, ⁵⁰.

The undead state in which *Theseus* carries her crew is, of course, another iteration of the venerable suspended animation riff (although I'd like to think I've broken new ground by invoking vampire physiology as the mechanism). Two recent studies have put the prospect of induced hibernation closer to realization. Blackstone *et al.* have induced hibernation in mice by the astonishingly-simple expedient of exposing them to hydrogen sulfide⁵¹; this gums up their cellular machinery enough to reduce metabolism by 90%. More dramatically (and invasively), researchers at Safar Center for Resuscitation Research in Pittsburgh claim⁵² to have resurrected a dog three

hours after clinical death, via a technique in which the animal's blood supply was replaced by an ice-cold saline solution⁵³. Of these techniques, the first is probably closer to what I envisioned, although I'd finished the first draft before either headline broke. I considered rejigging my crypt scenes to include mention of hydrogen sulfide, but ultimately decided that fart jokes would have ruined the mood.

THE GAME BOARD

Blindsight describes Big Ben as an "Oasa Emitter". Officially there's no such label, but Yumiko Oasa has reported finding hitherto-undocumented infrared emitters^{54, 55} (dimmer than brown dwarves, but possibly more common^{56, 57}) ranging in mass from three to thirteen Jovian masses. My story needed something relatively local, large enough to sustain a superJovian magnetic field, but small and dim enough to plausibly avoid discovery for the next seventy or eighty years. Oasa's emitters suit my needs reasonably well (notwithstanding some evident skepticism over whether they actually exist⁵⁸).

Of course I had to extrapolate on the details, given how little is actually known about these beasts. To this end I pilfered data from a variety of sources on gas giants^{59, 60, 61, 62, 63, 64, 65} and/or brown dwarves^{66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76}, scaling up or down as appropriate. From a distance, the firing of *Rorschach*'s ultimate weapon looks an awful lot like the supermassive x-ray and radio flare recently seen erupting from a brown dwarf that should have been way too small to pull off such a trick⁷⁷. That flare lasted twelve hours, was a good billions times as strong as anything Jupiter ever put out, and is thought to have resulted from a twisted magnetic field⁷⁸.

Burns-Caulfield is based loosely on 2000 Cr₁₀₅, a trans-Newtonian comet whose present orbit cannot be completely explained by the gravitational forces of presently-known objects in the solar system⁷⁹.

SCRAMBLER ANATOMY AND PHYSIOLOGY

Like many others, I am weary of humanoid aliens with bumpy foreheads, and of giant CGI insectoids that may *look* alien but who act like rabid dogs in chitin suits. Of course, difference for its own arbitrary sake is scarcely better than your average sagittal-crested Roddenoid; natural selection is as ubiquitous as life itself, and the same basic processes will end up shaping life wherever it evolves. The challenge is thus to create an "alien" that truly lives up to the word, while remaining biologically plausible.

Scramblers are my first shot at meeting that challenge— and given how much they resemble the brittle stars found in earthly seas, I may have crapped out on the whole unlike-anything-you've-ever-seen front, at least in terms of gross morphology. It turns out that brittle stars even have something akin to the scrambler's distributed eyespot array. Similarly, scrambler reproduction— the budding of stacked newborns off a common stalk— takes its lead from jellyfish. You can take the marine biologist out of the ocean, but...

Fortunately, scramblers become more alien the closer you look at them. Cunningham remarks that nothing like their time-sharing motor/sensory pathways exists on Earth. He's right as far as he goes, but I can cite a precursor that might conceivably evolve into such an arrangement. Our own "mirror neurons" fire not only when we perform an action, but when we observe someone else performing the same action⁸⁰; this characteristic has been cited in the evolution of both language and of consciousness⁸¹· ⁸²· ⁸³.

Things look even more alien on the metabolic level. Here on Earth anything that relied solely on anaerobic ATP production never got past the single-cell stage. Even though it's more efficient than our own oxygen-burning pathways, anaerobic metabolism is just too damn *slow* for advanced multicellularity⁸⁴. Cunningham's proposed solution is simplicity itself. The catch is, you have to sleep for a few thousand years between shifts.

The idea of quantum-mechanical metabolic processes may sound even wonkier, but it's not. Wave-particle duality can exert significant impacts on biochemical reactions under physiological conditions at room temperature⁸⁵; heavy-atom carbon tunnelling has been reported to speed up the rate of such reactions by as much as 152 *orders of magnitude*⁸⁶.

And how's *this* for alien: *no genes*. The honeycomb example I used by way of analogy originally appeared in Darwin's little-known treatise⁸⁷ (*damn* but I've always wanted to cite that guy); more recently, a small but growing group of biologists have begun spreading the word that nucleic acids (in particular) and genes (in general) have been seriously overrated as prerequisites to life^{88, 89}. A great deal of biological complexity arises not because of genetic programming, but through the sheer physical and chemical interaction of its components^{90, 91, 92, 93}. Of course, you still need something to set up the initial conditions for those processes to emerge; that's where the magnetic fields come in. No candy-ass string of nucleotides would survive in *Rorschach's* environment anyway.

The curious nitpicker might be saying "Yeah, but without genes how do these guys *evolve*? How to they adapt to novel environments? How, as a species, do they cope with the *unexpected*?" And if Robert Cunningham were here today, he might say, "I'd swear half the immune system is actively targetting the other half. It's not just the immune system, either. Parts of the nervous system seem to be trying to, well, hack each other. I think they evolve *intraorganismally*, as insane as that sounds. The whole organism's at war with itself on the tissue level, it's got some kind of cellular Red Queen thing happening. Like setting up a colony of interacting tumors, and counting on fierce competition to keep any one of them from getting out of hand. Seems to serve the same role as sex and mutation does for us." And if you rolled your eyes at all that doubletalk, he might just blow smoke in your face and refer to one immunologist's interpretation of exactly those concepts, as exemplified in (of all things) *The Matrix Revolutions*⁹⁴. He might also point out that that the synaptic connections of your own

brain are shaped by a similar kind of intraorganismal natural selection⁹⁵, one catalysed by bits of parasitic DNA called *retrotransposons*.

Cunningham actually did say something like that in an earlier draft of this book, but the damn thing was getting so weighed down with theorising that I just cut it. After all, *Rorschach* is the proximate architect of these things, so it could handle all that stuff even if individual scramblers couldn't. And one of *Blindsight*'s take-home messages is that life is a matter of *degree*—the distinction between living and non-living systems has always been an iffy one^{96, 97, 98}, never more so than in the bowels of that pain-in-the-ass artefact out in the Oort.

SENTIENCE/INTELLIGENCE

This is the heart of the whole damn exercise. Let's get the biggies out of the way first. Metzinger's *Being No One*⁹⁹ is the toughest book I've ever read (and there are still significant chunks of it I haven't), but it also contains some of the most mindblowing ideas I've encountered in fact or fiction. Most authors are shameless bait-and-switchers when it comes to the nature of consciousness. Pinker calls his book *How the Mind Works*¹⁰⁰, then admits on page one that "We don't understand how the mind works". Koch (the guy who coined the term "zombie agents") writes *The Quest for Consciousness: A Neurobiological Approach*¹⁰¹, in which he sheepishly sidesteps the whole issue of why neural activity should result in any kind of subjective awareness whatsoever.

Towering above such pussies, Metzinger takes the bull by the balls. His "World-zero" hypothesis not only explains the subjective sense of self, but also why such an illusory first-person narrator would be an emergent property of certain cognitive systems in the first place. I have no idea whether he's right—the man's way beyond me—but at least he addressed the *real* question that keeps us staring at the ceiling at three a.m., long after the last roach is spent. Many of the syndromes and maladies dropped into *Blindsight* I first encountered in

Metzinger's book. Any uncited claims or statements in this subsection probably hail from that source.

If they don't, then maybe they hail from Wegner's *The Illusion of Conscious Will*¹⁰² instead. Less ambitious, far more accessible, Wegner's book doesn't so much deal with the nature of *consciousness* as it does with the nature of *free will*, which Wegner thumbnails as "our mind's way of estimating what it thinks it did.". Wegner presents his own list of syndromes and maladies, all of which reinforce the mind-boggling sense of what fragile and subvertible machines we are. And of course, Oliver Sacks¹⁰³ was sending us memos from the edge of consciousness long before consciousness even had a bandwagon to jump on.

It might be easier to list the people who *haven't* taken a stab at "explaining" consciousness. Theories run the gamut from diffuse electrical fields to quantum puppet-shows; consciousness has been "located" in the frontoinsula cortex and the hypothalamus and a hundred dynamic cores in between^{104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114}. (At least one theory¹¹⁵ suggests that while great apes and adult Humans are sentient, young Human children are not. I admit to a certain fondness for this conclusion; if children *aren't* nonsentient, they're certainly psychopathic).

But beneath the unthreatening, superficial question of what consciousness *is* floats the more functional question of what it's good for. *Blindsight* plays with that issue at length, and I won't reiterate points already made. Suffice to say that, at least under routine conditions, consciousness does little beyond taking memos from the vastly richer subconscious environment, rubber-stamping them, and taking the credit for itself. In fact, the nonconscious mind usually works so well on its own that it actually employs a gatekeeper in the anterior cingulate cortex to do nothing but *prevent* the conscious self from interfering in daily operations^{116, 117, 118}. (If the rest of your brain *were* conscious, it would probably regard you as the pointy-haired boss from *Dilbert*.)

Sentience isn't even necessary to develop a "theory of mind".

That might seem completely counterintuitive: how could you learn to recognise that other individuals are autonomous agents, with their own interests and agendas, if you weren't even aware of your own? But there's no contradiction, and no call for consciousness. It is entirely possible to track the intentions of others without being the slightest bit self-reflective¹¹⁹. Norretranders declared outright that "Consciousness is a fraud"¹²⁰.

Art might be a bit of an exception. Aesthetics seem to require some level of self-awareness—in fact, the evolution of aesthetics might even be what got the whole sentience ball rolling in the first place. When music is so beautiful it makes you shiver, that's the reward circuitry in your limbic system kicking in: the same circuitry that rewards you for fucking an attractive partner or gorging on sucrose¹²¹. It's a hack, in other words; your brain has learned how to get the reward without actually earning it through increased fitness¹²². It feels good, and it fulfills us, and it makes life worth living. But it also turns us inward and distracts us. Those rats back in the sixties, the ones that learned to stimulate their own pleasure centers by pressing a lever: remember them? They pressed those levers with such addictive zeal that they forgot to eat. They starved to death. I've no doubt they died happy, but they *died*. Without issue. Their fitness went to Zero.

Aesthetics. Sentience. Extinction.

And that brings us to the final question, lurking way down in the anoxic zone: the question of what consciousness *costs*. Compared to nonconscious processing, self-awareness is slow and expensive¹²³. (The premise of a separate, faster entity lurking at the base of our brains to take over in emergencies is based on studies by, among others, Joe LeDoux of New York University^{124, 125}). By way of comparison, consider the complex, lightning-fast calculations of savantes; those abilities are noncognitive¹²⁶, and there is evidence that they owe their superfunctionality not to any overarching integration of mental processes but due to relative neurological *fragmentation*¹²⁷. Even if sentient and nonsentient processes were equally efficient, the

conscious awareness of visceral stimuli—by its very nature—distracts the individual from other threats and opportunities in its environment. (I was quite proud of myself for that insight. You'll understand how peeved I was to discover that Wegner had already made a similar point back in 1994¹²⁸.) The cost of high intelligence has even been demonstrated by experiments in which smart fruit flies lose out to dumb ones when competing for food¹²⁹, possibly because the metabolic demands of learning and memory leave less energy for foraging. No, I haven't forgotten that I've just spent a whole book arguing that intelligence and sentience are different things. But this is still a relevant experiment, because one thing both attributes do have in common is that they are metabolically *expensive*. (The difference is, in at least some cases intelligence is worth the price. What's the survival value of obsessing on a sunset?)

While a number of people have pointed out the various costs and drawbacks of sentience, few if any have taken the next step and wondered out loud if the whole damn thing isn't more trouble than it's worth. Of course it is, people assume; otherwise natural selection would have weeded it out long ago. And they're probably right. I hope they are. *Blindsight* is a thought experiment, a game of *Just suppose* and *What if*. Nothing more.

On the other hand, the dodos and the Steller sea cows could have used exactly the same argument to prove their own superiority, a thousand years ago: *if we're so unfit, why haven't we gone extinct?* Why? Because natural selection takes time, and luck plays a role. The biggest boys on the block at any given time aren't necessarily the fittest, or the most efficient, and the game isn't over. The game is *never* over; there's no finish line this side of heat death. And so, neither can there be any winners. There are only those who haven't yet lost.

Cunningham's stats about self-recognition in primates: those too are real. Chimpanzees have a higher brain-to-body ratio than orangutans¹³⁰, yet oranges consistently recognise themselves in mirrors while chimps do so only half the time¹³¹. Similarly, those nonhuman species with the most sophisticated

language skills are a variety of birds and monkeys—not the presumably "more sentient" great apes who are our closest relatives¹³² ¹³³. If you squint, facts like these suggest that sentience might almost be a phase, something that orangutans haven't yet grown out of but which their more-advanced chimpanzee cousins are beginning to. (Gorillas don't self-recognise in mirrors. Perhaps they've already grown out of sentience, or perhaps they never grew into it.)

Of course, Humans don't fit this pattern. If it even is a pattern. We're outliers: that's one of the points I'm making.

I bet vampires would fit it, though. That's the other one.

Finally, some very timely experimental support for this unpleasant premise came out just as *Blindsight* was being copy edited: it turns out that the unconscious mind is better at making complex decisions than is the conscious mind¹³⁴. The conscious mind just can't handle as many variables, apparently. Quoth one of the researchers: "At some point in our evolution, we started to make decisions consciously, and we're not very good at it."¹³⁵

MISCELLANEOUS AMBIENCE (BACKGROUND DETAILS, BAD WIRING, AND THE HUMAN CONDITION)

The child Siri Keeton was not unique: we've been treating certain severe epilepsies by radical hemispherectomy for over fifty years now¹³⁶. Surprisingly, the removal of half a brain doesn't seem to impact IQ or motor skills all that much (although most of hemispherectomy patients, unlike Keeton, have low IQs to begin with)¹³⁷. I'm still not entirely sure why they *remove* the hemisphere; why not just split the corpus callosum, if all you're trying to do is prevent a feedback loop between halves? Do they scoop out one half to prevent alien hand syndrome—and if so, doesn't that imply that they're knowingly destroying a sentient personality?

The maternal-response opioids that Helen Keeton used to kickstart mother-love in her damaged son was inspired by recent work on attachment-deficit disorders in mice¹³⁸. The

iron-scavenging clouds that appear in the wake of the Firefall are based on those reported by Plane *et al.*¹³⁹. I trawled The Gang of Four's linguistic jargon from a variety of sources¹⁴⁰ ¹⁴¹ ¹⁴² ¹⁴³. The multilingual speech patterns of *Theseus'* crew (described but never quoted, thank God) were inspired by the musings of Graddol¹⁴⁴, who suggests that science must remain conversant in multiple grammars because language leads thought, and a single "universal" scientific language would constrain the ways in which we view the world.

The antecedent of Szpindel's and Cunningham's extended phenotypes exists today, in the form of one Matthew Nagel¹⁴⁵. The spliced prosthetics that allow them to synesthetically perceive output from their lab equipment hails from the remarkable plasticity of the brain's sensory cortices: you can turn an auditory cortex into a visual one by simply splicing the optic nerve into the auditory pathways (if you do it early enough)¹⁴⁶ ¹⁴⁷. Bates' carboplatinum augments have their roots in the recent development of metal musculature¹⁴⁸ ¹⁴⁹. Sascha's ironic denigration of TwenGen psychiatry hails not only from (limited) personal experience, but from a pair of papers¹⁵⁰ ¹⁵¹ that strip away the mystique from cases of so-called *multiple personality disorder*. (Not that there's anything wrong with the concept; merely with its diagnosis.) The fibrodysplasia variant that kills Chelsea was based on symptoms described by Kaplan *et al.*¹⁵².

And believe it or not, those screaming faces Sarasti used near the end of the book represent a very real form of statistical analysis: Chernoff Faces¹⁵³, which are more effective than the usual graphs and statistical tables at conveying the essential characteristics of a data set¹⁵⁴.

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ECHOPRAXIA

ACKNOWLEDGMENTS

It's been a while. Three editors, three family deaths, one near-fatal brush with flesh-eating disease. A felony conviction. A marriage.

Now this.

I'm not quite sure what "this" is, exactly—but for good or ill, I couldn't have pulled it off without help. In fact, I wouldn't even be *alive* now without help. So first and foremost, let me acknowledge the contribution of one Caitlin Sweet. *Echopraxia* would not exist without her, because I would not exist without her; I would have died of necrotizing fasciitis on February 12, 2011. (Darwin Day. Seriously. Look it up.) As a perverse reward for saving my life, Caitlin got to endure endless hours in the shower, or in bed, or at restaurants, listening to me whinge endlessly about how this scene was too talky and that climax too contrived; she would then suggest some elegant solution that might have occurred to me eventually, but probably not before deadline. Her insights are golden. If their implementation sucks it's my fault, not hers.

The first couple of chapters also had the benefit of being workshopped by two different groups of writers: those at Gibraltar Point (Michael Carr, Laurie Channer, John McDaid, Becky Maines, Elisabeth Mitchell, Dave Nickle, Janis O'Connor, and Rob Stauffer); and those at Cecil Street (Madeline Ashby, Jill Lum, Dave Nickle—again—Helen Rykens, Karl Schroeder, Sara Simmons, Michael Skeet, Doug Smith, Hugh Spencer, Dale Sproule, and Dr. Allan Weiss).

I've kept lists over the years, tried to document the various insights, references, and crazy-ass hallucinatory what-ifs that informed the writing of this book. I've tried to keep track of those who sent me papers and those who actually *wrote* the damn things, those who made offhand remarks in blog posts or

jabbed a finger at my chest while making some drunken point during a barroom debate. I wanted to list everyone by the nature of their contribution: beta reader; scientific authority; infopipe; devil's advocate.

For the most part, I couldn't do it. There's just too much overlap. All those superimposed colors turn the Venn diagram into a muddy gray disk. So, for the most part, I'll have to fall back on alphabetical order when I thank Nick Alcock, Beverly Bambury, Hannu Bloomila, Andrew Buhr, Nancy Cerelli, Alexey Cheberda, Dr. Krystyna Chodorowksa, Jacob Cohen, Anna Davour, Alyx Dellamonica, Sibylle Eisbach, Jon Enerson, Val Grimm, Norm Haldeman, Thomas Hardman, Dr. Andrew Hessel, Keith Honeyborne, Seth Keiper, Dr. Ed Keller, Chris Knall, Leonid Korogodski, Do-Ming Lum, Danielle MacDonald, Dr. Matt McCormick, Chinedum Ofoegbu, Jesús Olmo, Chris Pepper, Janna Randina, Kelly Robson, Patrick "Bahumat" Rochefort, Dr. Kaj Sotala, Dr. Brad Templeton, and Rob Tucker. And some mysterious dude who only goes by the name "Random J."

Some folks, however, went above and beyond in singular and specific ways. Dr. Dan Brooks ranted and challenged and acted as occasional traveling companion. Kristin Choffe did her best to teach me the essentials of DNA barcoding, although she couldn't keep me from sucking at it. (She also fronted me a vial containing the refined DNA of a dozen plant and animal species, with which I washed out my mouth before submitting a cheek swab to the Department of Homeland Security.) Leona Lutterodt described God as a Process, which lit an LED in my brain. Dr. Deborah McLennan snuck me through the paywalls. Sheila Miguez pointed me to a plug-in that made it vastly easier to insert citations into Notes and References (I will understand if, after reading that section, you decide to hate her for the same reason). Ray Neilson kept me on my toes and kept my Linux box running. Mark Showell saw me working on a laptop that was literally held together with binder clips, and took pity. Cat Sparks moved me halfway around the world; she was the fulcrum that tipped the worst year of my life into the best.

Some of these people are meatspace friends; others are pixelpals. They've argued with me online and off, punched holes in whatever bits of *Echopraxia* leaked out during gestation, passed me countless references on everything from hominid genetics to machine consciousness to metal-eating bacteria. They are a small army but a very smart one, and despite my best efforts I'm probably forgetting some of them. I hope those I've neglected here will forgive me.

Howard Morhaim. After dealing with agents whose advice ran the gamut from *Buy my book* to *I'll only represent you if you write a near-future techno-thriller about a marine biologist*, Howard told me to write what I was inspired to: selling it, he insisted, was *his* job. This might not be the most opportunistic attitude to adopt in a Darwinian marketplace, but man it was nice to run into someone who put the writing first for a change.

Ironically, my next novel is most likely going to be a near-future techno-thriller about a marine biologist.

NOTES AND REFERENCES

I am naked as I type this.

I was naked writing the whole damn book.

I aspire to a certain degree of discomfort in my writing, on the principle that if you never risk a face-plant you never go anywhere new. And if there's one surefire way to get me out of my comfort zone, it's the challenge of taking invisible omnipotent sky fairies seriously enough to incorporate into a hard SF novel. The phrase "faith-based hard SF" may, in fact, be the ultimate oxymoron—Clarke's Third notwithstanding—which means that *Echopraxia* could be my biggest face-plant since *Behemoth* (especially in the wake of *Blindsight*, which continues to surprise with all the love it's garnered over the years). And thanks to a lack of empirical evidence (as of this writing, anyway) for the existence of deities, I can't even fall back on my usual strategy of shielding my central claims behind papers from *Nature*.

I can try to shield everything else there, though. Perhaps that will do.

PSY-OPS AND THE CONSCIOUSNESS GLITCH

I'm not dwelling too much on consciousness this time around—I pretty much shot my load on that subject with *Blindsight*—except to note in passing that the then-radical notion of consciousness-as-nonadaptive-side-effect has started appearing in the literature,¹ and that more and more "conscious" activities (including math!²) are turning out to be nonconscious after all^{3,4,5} (though holdouts remain⁶).

One fascinating exception informs Keith Honeyborne's report on "Prismatics," who nearly drown themselves to achieve a heightened state of awareness. The premise of Ezequiel Morsella's PRISM model^{7,8} is that consciousness originally

evolved for the delightfully mundane purpose of mediating conflicting motor commands to the skeletal muscles. (I have to point out that exactly the same sort of conflict—the impulse to withdraw one’s hand from a painful stimulus, versus the knowledge that you’ll die if you act on that impulse—was exactly how the Bene Gesserit assessed whether Paul Atreides qualified as “Human” during their *gom jabbar* test in Frank Herbert’s *Dune*.)

Everything else comes down to tricks and glitches. The subliminal “gang signs” Valerie programmed onto the *Crown*’s bulkheads seem a logical (if elaborate) extension of the newborn field of optogenetics.⁹ The “sensed presence” Dan Brüks and Lianna Lutterodt experienced in the attic results from a hack on the temporoparietal junction that screws up the brain’s body map^{10,11} (basically, the part of your brain that keeps track of your body parts gets kicked in the side and registers a duplicate set of body parts off-center). Sengupta’s induced misiphonia is a condition in which relatively innocuous sounds—a slurp, a hiccup—are enough to provoke violent rage.¹² All of this *was* inflicted in the service of education, though: as Brüks points out, fear promotes memory formation.^{13,14}

Fear and belief can also kill you,¹⁵ a trick used to good effect in certain religious practices.¹⁶ And in case you were wondering what was up with the fusiform gyrus there at the end (a couple of my beta readers did), it’s the structure containing the face-recognition circuitry¹⁷ we tweaked to amp up the mutual-agonism response in vampires. It’s part of the same circuitry that evolved to let us see faces in the clouds, involved—once again—in the evolution of our religious impulse (see below).

The brain’s habit of literalizing metaphors—the tendency to regard people as having “warmer” personalities when you happen to be holding a mug of coffee, the Bicamerals’ use of hand-washing to mitigate feelings of guilt and uncertainty—is also an established neurological fact.¹⁸

I pulled “induced thanopararosis” out of my ass. It’s a cool idea, though, huh?

UNDEAD UPDATE

Back in *Blindsight* I laid out a fair bit of groundwork on the biology and evolution of vampires. I'm not going to revisit that here (you can check out FizerPharm's stockholder presentation¹⁹ if you need a refresher), except for the citation in *Blindsight* implying that female vampires were impossible (the gene responsible for their obligate primatovory being located on the Y chromosome²⁰). More recent work by Cheberda et al have established a more general protocadherin dysfunction on both X and Y chromosomes,²¹ resolving this inadvertent paradox.

At any rate, zombies are more relevant to the current tale. Both surgical and viral varieties appear in *Echopraxia*; the surgically induced military model is essentially the "p-zombie" favored by philosophers²²; it already got a workout back in *Blindsight*. Examples of the viral model would include victims of the Pakistan pandemic: "civilian hordes reduced to walking brain stems by a few kilobytes of weaponized code drawn to the telltale biochemistry of conscious thought."

What telltale signatures might these bugs be targeting? Consciousness appears to be largely a property of distributed activity—the synchronous firing of far-flung provinces of the brain^{23,24}—but it is also correlated with specific locations and structures.²⁵ In terms of specific cellular targets I'm thinking maybe "von Economo neurons" or VENs: disproportionately large, anomalously spindly, sparsely branched neurons that grow 50 to 200 percent larger than the human norm.^{26,27} They aren't numerous—they occupy only 1 percent of the anterior cingulate gyrus and the fronto-insular cortex—but they appear to be crucial to the conscious state.

Zombie brains—freed from the metabolic costs of self-awareness—exhibit reduced glucose metabolism in those areas, as well as in the prefrontal cortex, superior parietal gyrus, and the left angular gyrus; this accounts the fractionally-reduced temperature of the zombie brain. Interestingly, the same metabolic depression can be found in the brains of clinically

insane murderers.²⁸

PORTIA

I'd like to start this section by emphasising how utterly cool *Portia*'s eight-legged namesake is in real life. That stuff about improvisational hunting strategies, mammalian-level problem-solving, and visual acuity all contained within a time-sharing bundle of neurons smaller than a pinhead—God's own truth, all of it.^{29,30,31,32}

That said, the time-sharing cognitive slime mold at Icarus is even cooler. Given the limitations of Human telematter technology at the end of the twenty-first century—and given that *any* invasive agent hitching a ride on someone else's beam would be well-advised to keep its structural complexity to a minimum—the capacity for some kind of self-assembly is going to be highly desirable once you reach your destination. Miras et al describe a process that might fit the rudiments of such a bill, at least.^{33,34} Once it starts assembling itself, I imagine that *Portia* might function something like Cooper's "iCHELLs"³⁵: inorganic metal cells, capable of reactions you could call "metabolic" without squinting too hard. Maybe with a sprinkling of magical fairy-dust plasma³⁶ (although I'm guessing those two processes might be incompatible).

ADAPTIVE DELUSIONAL SYSTEMS...

An enormous amount of recent research has been published about the natural history of the religious impulse and the adaptive value of theistic superstition.^{37,38,39,40,41,42,43,44} It's no great surprise that religion confers adaptive benefits, given the near-universality of that impulse among our species.^{45,46,47,48} If you're interested and you've got ninety minutes to spare, I'd strongly recommend Robert Sapolsky's brilliant lecture on the evolutionary and neurological roots of religious belief.⁴⁹

It's not all food taboos and slashed foreskins, though. Far

more relevant to the current discussion is the fact that religious minds exhibit certain characteristic neurological traits.⁵⁰ Believers, for example, are better than nonbelievers at finding patterns in visual data.⁵¹ Buddhist meditation increases the thickness of the prefrontal cortex and right anterior insula (structures associated with attention, interoception, and sensory processing).⁵² There's even circumstantial evidence that Christians are less ruled by their emotions than are nonbelievers⁵³ (although whether the rules they follow instead are any more rational is another question). Certain religious rituals are so effective at focusing the mind and relieving stress that some have suggested coopting them into a sort of "religion for atheists."⁵⁴

An obvious significant downside is that most religious beliefs—gods, souls, Space Disneyland—are held at best in the complete absence of empirical evidence (and are more frequently held in the face of *opposing* evidence). While it remains impossible to disprove the negative, for most practical purposes it's reasonable to describe such beliefs as simply *wrong*.

It was only during the writing this book that it occurred to me to wonder if one couldn't say the same about science.

Lutterodt's comparison of religious faith with the physiology of vision came to me while I was reading Inzlicht et al,⁵⁵ a paper that describes religion as an internal model of reality that confers benefits even though it's wrong. While that idea is nothing new, the way it was phrased was so reminiscent of the way our brains work—the old survival-engines-not-truth-detectors shtick—that I had to wonder if the whole right/wrong distinction might be off the table the moment any worldview passes through a Human nervous system. And the *next* paper⁵⁶ I read suggested that certain cosmic mysteries might not be a function of dark energy so much as inconstancies in the laws of physics—and if that *were* the case, there'd really be no way to tell...

Of course, there's absolutely no denying the functional utility of the scientific method, especially when you compare it to the

beads and rattles of those guys with the funny hats. Still, I have to admit: not entirely comfy with where that seemed to be heading for a bit.

...AND THE BICAMERAL CONDITION

The Bicameral Order did not begin as a hive. They began as a fortunate juxtaposition of adaptive malfunctions and sloppy fitness.

The name does not derive from Julian Jaynes.⁵⁷ Rather, both Jaynes and the Order recall a time when paired hemispheres were the only option: the right a pragmatic and unimaginative note-taker, the left a pattern-matcher.⁵⁸ Think of “gene duplication,” that process by which genetic replication occasionally goes off the rails to serve up multiple copies of a gene where only one had existed before; these become “spares” available for evolutionary experimentation. Hemispheric lateralization was a little like that. A pragmatist core; a philosopher core.

The left hemisphere is on a quest for meaning, even when there isn’t any. False memories, pareidolia—the stress-induced perception of pattern in noise⁵⁹—these are Lefty’s doing. When there are no data, or no meaning, Lefty may find it anyway. Lefty gets religion.

But sometimes patterns are subtle. Sometimes, noise is almost all there is: a *kind* of noise anyway, at least to classically evolved senses. Smeared probabilities, waves that obscure the location or momentum of whatever you’re squinting at. Virtual particles that elude detection anywhere past the edges of black holes. Maybe, when you move a few orders of magnitude away from the world our senses evolved to parse, a touch of pareidolia can take up the slack. Like the feather that evolved for thermoregulation and then got press-ganged, fully formed, into flight duty, perhaps the brain’s bogus-purpose-seeking wetware might be repurposed to finding patterns it once had to *invent*. Maybe the future is a fusion of the religious and the empirical.

Maybe all Lefty needs is a little help.

Malfunctions and breakdowns showed them the way. Certain kinds of brain damage result in massive increases in certain types of creativity.¹⁶ Strokes provoke bursts of artistic creativity,⁶⁰ frontotemporal dementia supercharges some parts of the brain even as it compromises others.⁶¹ Some autistics possess visual hyperacuity comparable to that of birds of prey, even though they're stuck with the same human eyes as the rest of us.⁶² Schizophrenics are immune to certain optical illusions.⁶³ At least some kinds of synesthesia confer cognitive advantages⁶⁴ (people who literally *see time*, arrayed about them in multicolored splendor, are twice as good as the rest of us at recalling events from their own personal timelines⁶⁵). And—as Daniel Brüks reflects—brain damage is actually a prerequisite for basic rationality in certain types of decision-making.⁶⁶

The Bicamerals set out to damage their brains, in very specific ways. They manipulated the expression of NR2B,⁶⁷ tweaked TRNP-1⁶⁸ production, used careful cancers to promote growth (their genes tagged for easy identification,⁶⁹ should anything go wrong) and increase neurosculptural degrees of freedom. Then they ruthlessly weeded those connections, pruned back the tangle into optimum, isolated islands of functionality.⁷⁰ They improved their pattern-matching skills to a degree almost inconceivable to mere baselines.

Such enhancements come at a cost.^{71,72} Bicamerals have lost the ability to communicate effectively across the cognitive-species divide. It's not just that they've rewired their speech centers⁷³ and are now using different parts of the brain to talk; they *think* now almost entirely in metaphor, in patterns that contain meaning even if they don't, strictly speaking, exist.

Things get even messier when linked into networks, which can literally scatter one's mind even at today's rudimentary levels of connectivity. The "transactive memory system" called Google is already rewiring the parts of our brains that used to remember facts locally; now those circuits store search protocols for remote access of a distributed database.⁷⁴ And Google doesn't come anywhere close to the connectivity of a

real hive mind.

Which is not to say that hive minds aren't already a ubiquitous part of Human society. *You* are a hive mind, always have been: a single coherent consciousness spread across two cerebral hemispheres, each of which—when isolated—can run its own stand-alone, conscious entity with its own thoughts, aesthetics, even religious beliefs.⁷⁵ The reverse also happens. A hemisphere forced to run solo when its partner is anaesthetised (preparatory to surgery, for instance) will manifest a different personality than the brain as a whole—but when those two hemispheres reconnect, that solo identity gets swallowed up by whatever dual-core persona runs on the whole organ.¹⁶ Consciousness expands to fill the space available.

The Bicameral hive takes its lead from Krista and Tatiana Hogan, conjoined craniopagus twins whose brains are fused at the thalamus.⁷⁶ Among other things, the thalamus acts as a sensory relay; the twins share a common set of sensory inputs. Each sees through the other's eyes. Tickle one, the other laughs. Anecdotal evidence suggests that they can share thoughts, and although they have distinct personalities each uses the word “I” when talking about the other twin.

All this resulting from fusion at a *sensory* relay. Suppose they were linked farther up? A thought doesn't know to stop and turn back when it reaches the corpus callosum. Why would it behave any differently if it encountered a callosum of a different sort; why should two minds linked by a sufficiently fat pipe be any more distinct than the halves of your own brain?

Sufficiently high bandwidth, therefore, would likely result in a single integrated consciousness across any number of platforms. Technologically, the links themselves might exploit so-called “ephatic coupling”⁷⁷ (in which direct synaptic stimulation is bypassed and neurons are induced to fire by diffuse electrical fields generated elsewhere in the brain). Synchrony is vital: unified conscious only exists when all parts fire together with a signal latency of a few hundred milliseconds, tops.^{23,24} Throttle that pipe and it should be possible to retain individuality while accessing memories and

sensory data from your fellow nodes.⁷⁸

I've kept the extent of Bicameral hive integration flexible, allowing internode connections to throttle up and down as the need arises—but whether those bandwidth-versus-dialup decisions are made by the nodes themselves or by something more *inclusive* remains ambiguous. If you want some hint of the ramifications of total cognitive integration, I point you to the (apparently) catatonic Moksha Mind of the Eastern Dharmic Alliance.⁷⁹

However the hive links up—whatever its degree of conscious coherence—it is a religious experience. Literally.

We know what rapture is: a glorious malfunction, a glitch in the part of the brain that keeps track of where the body ends and everything else begins.⁸⁰ When that boundary dissolves the mind feels connected to *everything*, feels literally at one with the universe. It's an illusion, of course. Transcendence is experience, not insight. That's not why Bicamerals feel the rapture.

They feel it because it's an unavoidable side effect of belonging to a hive. Sharing sensory systems, linking minds one to another—such connections really *do* dissolve the boundaries between bodies. Bicameral spiritual rapture isn't so much an illusion as a bandwidth meter. It still feels good, of course, which has its own implications. Bicams rap out when they hook up to solve problems. They actually *get off* on discovery; if baselines got those kind of rewards they wouldn't need tenure.

The side effect has side effects, though. The activation of rapture-related neurocircuitry generates glossolalia even in baseline brains^{81,82}; given the modifications that Bicamerals use to enhance transcendence,^{83,84} the occasional bout of speaking in tongues is pretty much a given. Brüks should be thankful the hive doesn't just scream all the time.

In hindsight, it is apparent that describing the Bicamerals as a religious order is a little misleading: the parts of the brain they've souped up simply overlap with the parts that kick in during religious neurobehavioral events, so the manifestations are similar. Whether that's a distinction that makes a difference

is left as an exercise for the reader.

GOD AND THE DIGITAL UNIVERSE

The idea of God as a virus only really works if you buy into the burgeoning field of digital physics.⁸⁵ Most of you probably know what that is: a family of models based on the premise that the universe is discrete and mathematic at its base, and that every event therein can therefore be thought of as a kind of computation. Digital physics comes in several flavors: the universe is a simulation running in a computer somewhere^{86,87,88}; or the universe is a vast computer in its own right, where matter is hardware and physics is software and every flip of an electron is a calculation. In some versions matter itself is illusory, a literal instantiation of numbers.^{89,90} In others, reality is a hologram and the universe is empty inside^{91,92,93}; the real action takes place way out on its two-dimensional boundary, and we are merely interferences patterns projected from the surface of a soap bubble into its interior. There's no shortage of popular summaries of all this stuff, either online⁹⁴ or off.⁹⁵

Lee Smolin (of Waterloo's Perimeter Institute) goes against the grain: he rejects digital physics outright and serves up a single universe in which time is not an illusion, reality is not deterministic, and universes themselves grow, reproduce, and evolve via natural selection writ *very* large (think of black holes as offspring; think of entropy as a selective force).^{96,97,98} Even Smolin's model, however, is vulnerable to inconstancy in the laws of physics; the model actually predicts that physical laws evolve along with the rest of reality. Which kind of leaves us back at the question of how one can legitimately assume constancy in an inconstant universe.

You can't get through these references without realizing that, whacked out as it sounds, digital physics has a lot of scientific heavy-hitters on its side. I, of course, am not one of them; but since so many smarter people are defending the premise, I'm happy to sneak viral deities onto the back of all their hard work

and hope it slips through.

MISCELLANEOUS BACKGROUND AMBIANCE

The fieldwork preoccupying Brüks at the start of the story descends from the “DNA barcoding” that’s all the rage today: a quick-and-dirty taxonomic technique for distinguishing species based on a chunk of the cytochrome oxidase gene.⁹⁹ There’s no way it’ll still be around in its present form eight decades from now—we’ve already got handheld analyzers¹⁰⁰ that put conventional wet analysis right out to pasture—but the *concept* of a genetic barcode will, I think, persist even as the technology improves.

The vortex engine¹⁰¹ powering the Bicameral monastery derives from work patented by Louis Michaud,¹⁰² a retired engineer who basically came up with the idea while tinkering in his garage. I have no idea whether two-hundred-megawatt, twenty-kilometer-high wind funnels are in our future, but the patents went through,¹⁰³ and the project’s got some serious attention from government and academic agencies. Nobody’s saying the physics are wrong.

We are already closing in on learning techniques that bypass conscious awareness,¹⁰⁴ à la Lianna Lutterodt’s training at the hands of her Bicameral masters. Likewise, the precursors of the gimp hood that Brüks uses in lieu of a brain implant can be seen taking shape in a diversity of mind-reading/writing tech already extant in the literature.^{105,106,107,108,109} Brüks’s dependence on Cognital, on the other hand, marks him truly as a relic of a past age (ours, in fact): memory boosters are already in the pipe,^{110,111,112} and as far back 2008, one in five working scientists already indulged in brain-doping to help keep up with the competition.¹¹³

The use of massively multiplayer online games as a tool for epidemiological simulation was first proposed by Lofgren and Fefferman¹¹⁴; they, in turn, were inspired by an unexpected pandemic of “corrupted blood” in World of Warcraft,¹¹⁵ which occurred because people in RPGs—like those in real life—often

don't behave the way they're supposed to. I don't know how many have since picked up this ball and run with it—at least one paper speaks of using online gaming for economics research¹¹⁶—but if that's all there is I think we're missing a huge opportunity.

Near the end of this novel there's a teaching moment on the subject of natural selection. Most people seem to think that organisms develop adaptive traits in response to environmental change. This is bullshit. The environment changes and those who *already* happen to have newly adaptive traits don't get wiped out. A deteriorating Daniel Brüks muses on an especially neat case in point, the curious fact that the building blocks of advanced neural architecture already exist in single-celled animals lacking even the most rudimentary nervous systems.^{117,118,119,120}

A couple of isolated factoids. Fruit flies save energy in impoverished environments by becoming forgetful¹²¹; the construction and maintenance of memories is, after all, a costly affair. I imagine that Rhona McLennan's "Splinternet" is suffering the same sort of energetic triage after Icarus drops offline. And that bit where Brüks wondered why Moore even bothered exercising to stay in shape? That's because we're within spitting distance of a pill that puts your metabolism into hardbody mode even if you spend the whole day sitting on the couch snarfing pork rinds and watching *American Idol*.^{122,123}

The poem Brüks discovers in the desert as his mind is coming apart is not, contrary to what you might think, a hallucination. It is real. It is the warped brainchild of Canadian poet Christian Bök,¹²⁴ who has spent the past decade figuring out how to build a gene that not only spells a poem, but that functionally codes for a fluorescing protein whose amino acid sequence decodes into a *response* to that poem.¹²⁵ The last time we hung out he'd managed to insert it into *E. coli*, but his ultimate goal is to stick it into *Deinococcus radiodurans*, aka "Conan the Bacterium,"¹²⁶ aka the toughest microbial motherfucker that ever laughed at the inside of a nuclear reactor. If Christian's project comes through, his words could be iterating across the face of this

planet right up until the day the sun blows up. Who knew poetry could ever get that kind of a print run?

Finally: free will. Although free will (rather, its lack) is one of *Echopraxia*'s central themes (the neurological condition of echopraxia is to autonomy as blindsight is to consciousness), I don't have much to say about it because the arguments seem so clear-cut as to be almost uninteresting. Neurons do not fire spontaneously, only in response to external stimuli; therefore brains cannot *act* spontaneously, only in response to external stimuli.¹²⁷ No need to wade through all those studies that show the brain acting before the conscious mind "decides" to.^{128,129} Forget the revisionist interpretations that downgrade the definition from *free will* to *will that's merely unpredictable enough to confuse predators*.^{130,131} It's simpler than that: the switch cannot flip itself. QED. If you insist on clinging to this *free will* farce I'm not going to waste much time arguing here: plenty of others have made the case far more persuasively than I ever could.^{132,133,134,135}

But given this current state of the art, one of the more indigestible nuggets *Echopraxia* asks you to swallow is that eight decades from now, people will still buy into such an incoherent premise—that as we close on the twenty-second century, we will continue to act as though we have free will.

In fact, we might behave that way. It's not that you can't convince people that they're automatons; that's easy enough to pull off, intellectually at least. Folks will even change their attitudes and behavior in the wake of those insights¹³⁶—be more likely to cheat or less likely to hold people responsible for unlawful acts, for example.^{137,138} But eventually our attitudes drift back to pre-enlightenment baselines; even most of those who accept determinism somehow manage to believe in personal culpability.^{139,140} Over tens of thousands of years we just got used to cruising at one-twenty; without constant conscious intervention, we tend to ease back on the pedal to that place we feel most comfortable.

Echopraxia makes the same token concessions that society is likely to. You may have noticed the occasional reference to the

concept of personal culpability having been weeded out of justice systems the world over, that those dark-ages throwbacks still adhering to the notion are subject to human rights sanctions by the rest of the civilized world. Brüks and Moore squabble over “the old *no-free-will* shtick” back at the monastery. Adherents to those Eastern religions who never really took free will all that seriously anyway have buggered off into a hive-minded state of (as far as anyone can tell) deep catatonia. The rest of us continue to act pretty much the way we always have.

Turns out we don’t have much choice in the matter.

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February 13, 2082, First Contact. Sixty-two thousand objects of unknown origin plunge into Earth's atmosphere – a perfect grid of falling stars screaming across the radio spectrum as they burn. Not even ashes reach the ground. Three hundred and sixty degrees of global surveillance: something just took a snapshot.

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The world holds its breath and waits for the Second Coming – and while it waits, it fractures. Hive-minds coalesce, speaking in tongues; paleogeneticists resurrect nightmares from the dawn of humanity; soldiers are fitted with zombie switches to turn off consciousness in combat; half the population has retreated into the ersatz security of a virtual environment called Heaven.

Extinction beckons for *Homo Sapiens*.

But from deep space: whispers. Something out there talks – but

not to us. Two ships, *Theseus* and the *Crown of Thorns*, are launched to discover the origin of Earth's visitation, one bound for the outer dark of the Kuiper Belt, the other for the heart of the Solar System.

Their crews can barely be called human, what they will face certainly can't.

ABOUT THE AUTHOR

PETER WATTS is a science fiction writer and a reformed marine-mammal biologist. He is the author of the Rifiers trilogy, a winner of the Aurora, Hugo and Shirley Jackson awards and a Locus, Sturgeon and Campbell award nominee. Watts lives in Toronto.

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